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SIR JOSEPH BANKS

AND

THE ROYAL SOCIETY.

A POPULAR BIOGRAPHY, WITH AN
HISTORICAL INTRODUCTION
AND SEQUEL.

LONDON :

JOHN W. PARKER, WEST STRAND.

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P R E F A C E.

THE influence which the ROYAL SOCIETY OF LONDON has exerted during the last two hundred years upon science and art, and consequently in a great measure upon the prosperity of this country, must render authentic details respecting its history of much general interest. In the following sketch a few important points are brought into notice, indicative rather of its fortunes and prospects than of its proceedings, for these involve much of the history of nearly every department of science.

By connecting the life of SIR JOSEPH BANKS with the ROYAL SOCIETY little more is done than to continue the history of that distinguished body. During the long period of forty-one years he was its president, and devoted much of his time and means to the promotion of its interests and those of science generally.

In collecting materials for a notice of the life of this eminent individual a large number of trustworthy authorities have been consulted; and many passages have been selected from the beautiful and eloquent ELOGE pronounced on him by the BARON CUVIER, which, it is believed, has not hitherto been translated into our language. We are not permitted to doubt the justice and sincerity of praise from such a source, but

would rather admire the generous gratitude which dictated it.

In continuing a notice of the Royal Society after the death of Sir Joseph Banks, it was thought that greater interest would be imparted by using, as far as possible, the language of the distinguished persons who addressed the society on its own affairs. Several passages have therefore been selected from the published *Discourses* of the presidents, and from the *Reports of Committees* [appointed by the Society for special purposes.

A brief notice of the various scientific societies now existing, and which may be said to have originated in or sprung from the Royal Society, may not be thought an inappropriate conclusion to this little work.

The works of Wallis, Sprat, Birch, Thomson, and other writers on the Royal Society, are the authorities for many of the following details, when others are not indicated.

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SIR JOSEPH BANKS AND THE ROYAL SOCIETY.

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‘THE chief advantage of learned societies is the philosophical spirit to which they may be expected to give birth, and which they cannot fail to diffuse over all the various pursuits of the nations among whom they are established. The insulated scholar may without dread abandon himself to the spirit of system; he hears the voice of contradiction only from afar. But in a learned society the collision of systematic opinions soon terminates in their common destruction; while the desire of mutual conviction creates among the members a tacit compact, to admit nothing but the results of observation, or the conclusions of mathematical reasoning. Accordingly, experience has shewn how much these establishments have contributed, since their origin, to the spread of true philosophy. By setting the example of submitting everything to the examination of a severe logic, they have dissipated the prejudices which had too long reigned in the sciences, and which the strongest minds of the preceding centuries had not been able to resist. They have constantly opposed to empiricism a mass of knowledge against which the errors adopted by the vulgar, with an enthusiasm which in former times would have perpetuated their empire, have spent their force in vain. In a word, it has been in their bosoms that those grand theories have been conceived, which, although far exalted by their generality above the reach of the multitude, are for this very reason entitled to special encouragement, from their innumerable applications to the phenomena of nature, and to the practice of the arts.’ LA PLACE.

On the revival of letters in modern Europe, Italy was the first country to establish scientific societies and academies for the advancement of philosophy, literature, and the arts. Among the earliest may be mentioned the *Platonic Academy*, founded at Florence, in the year 1474, by Lorenzo de Medici, chiefly for the purpose of studying the works of Plato. The objects of this institution were afterwards extended to the improvement of the Italian language and literature, and to the study and explanation of the poetry of Dante. But the first

academy for the promotion of physical science was established at Naples, in the year 1560, under the name of *Academia Secretorum Naturæ*. It was, however, soon abolished by the ecclesiastical authorities. This was succeeded by the *Academia dei Lyncei*, founded at Rome, in the year 1609, by the Marchese Frederico Cesi, of which academy Galileo was an active member. It was dissolved soon after the death of its founder, in the year 1632. The following extracts from the regulations of this society are given by Mr. Drinkwater, in his excellent memoir of the life and labours of Galileo. They will serve, he remarks, to show the spirit in which this distinguished society was conceived; and, we may add, the spirit which ought to pervade all similar associations.

‘The Lyncean Society desires for its academicians, philosophers eager for real knowledge, who will give themselves to the study of nature, and especially to mathematics; at the same time it will not neglect the ornaments of elegant literature and philosophy, which, like a graceful garment, adorn the whole body of science. In the pious love of wisdom and the praise of the most good and most high God, let the Lynceans give their minds first to observation and reflection, and afterwards to writing and publishing. It is not within the Lyncean plan to find leisure for recitations and declamatory assemblies; the meetings will neither be frequent nor full, and chiefly for transacting the necessary business of the society; but those who wish to enjoy such exercises will in no respect be hindered, provided they attend them as accessory studies decently and quietly, and without making promises and professions of how much they are about to do. For there is ample philosophical employment for every one by himself, particularly if pains are taken in travelling and in the observation of natural phenomena, and in the book of nature which every one has at home, that is to say, the heavens and the earth; and enough may be learned from the habits of constant correspondence with each other, and alternate offices of counsel and assistance. Let the first fruits of wisdom be

love ; and so let the Lynceans love each other as if united by the strictest ties, nor suffer any interruption of this sincere bond of love and faith, emanating from the source of virtue and philosophy. Let them add to their names the title of Lyncean, which has been advisedly chosen as a warning and constant stimulus, especially when they write on any literary subject, also in their private letters to their associates, and in general when any work comes from them wisely and well performed. The Lynceans will pass over in silence all political controversies, and quarrels of every kind, and wordy disputes, especially gratuitous ones, which give occasion to deceit, unfriendliness, and hatred ; like men who desire peace, and seek to preserve their studies free from molestation, and to avoid every sort of disturbance. And if any one by command of his superiors, or from some other necessity, is reduced to handle such matters, since they are foreign to physical and mathematical science, and consequently alien to the object of the Academy, let them be printed without the Lyncean name.'

But the most celebrated institution was the *Accademia della Crusca*, founded at Florence in the year 1582, for the purpose of purifying the national tongue. The dictionary of this academy is still considered a standard authority for the Italian language. The celebrated Florentine *Accademia del Cimento*, or the Academy of Experiment, was instituted in the year 1567, for the cultivation of physical science, by the Cardinal Leopold de Medici, the brilliant reputation of which was due chiefly to the disciples of Galileo, Viviani and Torricelli.

The titles assumed by some of the Italian societies are exceedingly curious. Thus the Academy *della Crusca* signifies literally *of the bran or chaff*, in allusion to the great object of the academy, which was to sift, as it were, the flour of the language from the bran. The device adopted by this society was a *sieve*, with the motto, *Il più bel fior ne coglia*, that is, 'It collects the finest flour of it.' The name of the Lyncean Society just referred to had a similar fantastic origin: it was borrowed from the lynx, and had reference to the piercing

sight which that animal has been supposed to possess, and which ought to belong to those who purpose to investigate the secrets of nature. Although, at the present day, the name may appear to border on the grotesque, it was conceived in the spirit of the age; and the fantastic names of the numberless societies which were rapidly formed in various parts of Italy, far exceed whatever degree of quaintness may be thought to belong to the Lyncean name. The Inflamed—the Transformed—the Uneasy—the Humorists—the Fantastic—the Intricate—the Indolent—the Senseless—the Undeceived—the Valiant—the Æthereal societies, are selected from a vast number of similar institutions, the names of which, now almost their sole remains, are collected by the industry of Morhof and Tiraboschi. The Humorists are named by Morhof as the only Italian philosophical society anterior to the Lynceans; their founder was Paolo Mancino, and the distinctive symbol which they adopted was rain dropping from a cloud, with the motto *Redit agmine dulci*;—their title is derived from the same metaphor. The object of their union appears to have been similar to that of the Lynceans, but they at no time attained to the celebrity to which Ceci's society rose from the moment of its incorporation.

The example thus given by the Italian states soon extended its influence to other countries. In France, the *Académie Française* was founded in the year 1635 by Cardinal Richelieu, on the model of the *Accademia della Crusca*, and with a similar object,—namely, the purification and general improvement of the national language. This society also published a dictionary, which, with many additions and improvements, is still known by its original title of the *Dictionary of the Academy*. To England, however, belongs the honour of being the first, next to Italy, to establish a society for the purpose of encouraging experimental philosophy.

During the civil wars a number of learned and ingenious men, who took no part in the disturbances which then agitated their country, about the year 1645, acceded to the suggestion of a Mr. Haak, a native of Germany,

to meet once a week in order to discourse on subjects connected with mathematics and natural philosophy. Among those who first met for this laudable purpose were Doctors Wilkins, Wallis, Goddard, Ent, and Glisson, Mr. Haak, and Mr. Forster, the professor of astronomy at Gresham College. Their meetings were first held at Dr. Goddard's lodgings in Wood-street, where the Doctor had an apparatus for grinding glasses for telescopes. They sometimes also met at a house in Cheapside, and also in Gresham College. This is supposed to be the society mentioned by Boyle in a letter of the year 1646, under the name of the Invisible, or Philosophical Society.

In the years 1648 and 1649, Doctors Wilkins, Wallis, and Goddard, having been appointed to certain offices in the University of Oxford, formed a similar society in that city, which soon came to be attended by many of the eminent men already established there. The meetings were for some time held in Dr. Petty's lodgings, which were situated in the house of an apothecary, where the members were most conveniently supplied with materials for their experiments. Some time after, when Dr. Petty had left Oxford, the meetings were held in Dr. Wilkins' apartments, in Wadham College, and afterwards at the lodgings of Mr. Boyle.

About the year 1659 most of the members of this society, with the exception of Mr. Boyle, being again settled in London, rejoined their former associates, and met twice a week, at Gresham College, namely, on Wednesday, after the astronomical lecture of Mr. Christopher Wren, and on Thursday when Mr. Lawrence Rooke lectured on geometry. They were joined by several new members, and their meetings continued till the year 1659, when the political troubles consequent on the resignation of Richard Cromwell caused the members of the society to disperse, and the college was converted into quarters for soldiers. After the Restoration, in 1660, these meetings were revived and more numerous attended; and on the 28th November the members for the first time formed themselves into a regular society for

the promotion of experimental philosophy: they drew up a set of regulations whereby it was agreed that records should be made of all the works of nature and art of which any account could be obtained; so that the present age and posterity might be able to mark the errors which have been strengthened by long prescription, to restore truths which have long been neglected, and to extend the uses of those already known; thus making the way easier to those which are yet unknown. It was also resolved to admit men of different religions, professions, and nations, in order that the knowledge of nature might be freed from the prejudices of sects, and from a bias in favour of any particular branch of learning, and that all mankind might, as much as possible, be engaged in the pursuit of philosophy, which it was proposed to reform, not by laws and ceremonies, but by practice and example. It was further resolved that the society should not be a school where some might teach and others be taught, but rather a sort of laboratory where all persons might operate independently of one another. Lastly, it was resolved that each member should subscribe his name to an agreement that he would constantly attend the society's meetings, if not prevented by illness or some urgent business; that he should pay ten shillings on his admission, and also contribute the weekly sum of one shilling to meet the expenses of experiments, &c.; and they limited the number of members to fifty-five. Afterwards, however, this number was extended, and finally all limit was removed. A president, a secretary, and a register, were elected out of their body, and an amanuensis and operator engaged as servants to the society.

Thus originated the Royal Society of London, at a time which has been considered peculiarly favourable for the objects in view.

‘The spirit of inquiry, at first feeble, which animated some individuals at the time of the revival of learning, had, from numerous causes, gathered strength and spread itself over Europe. The Greek literary men, who had taken refuge in Italy after the destruction of the eastern

empire by the Turks, brought with them a knowledge of their language, and some of the first models of writing that ever have been produced. These books contributed to form the taste and enlighten the understandings of the poets and historians of Italy, whose labours were fortunately appreciated and encouraged by several of the principal men in that comparatively civilized country. The progress of the mathematical sciences in Italy, France, Germany, and England; the introduction of the new method of philosophizing by Lord Bacon; and the happy illustration of that method, by the successful exertions of Galileo, and some of his contemporaries and successors, awakened an enthusiastic ardour in the minds of literary men: the vast field of science lay exposed before them, the true path of investigation had been discovered, and all were eager to enter upon it. In that infant period of science every step was a discovery; every judicious experiment led the fortunate philosopher to eminence. But all were conscious of the immense space which was to be explored, of the little progress that could be made by a single individual, and of the necessity of mutual co-operation, and the division of scientific labour. Hence associations for the purpose of experiment were naturally suggested, as the only means of ensuring speedy and complete success. They furnished the money necessary for convenient apparatus, without pressing too severely upon individuals, and enabled the members to make considerable progress in investigations, without dedicating more of their time to such subjects than they could conveniently spare.

‘At that period, the diffusion of new discoveries was peculiarly difficult, and was chiefly accomplished by epistolary correspondence between philosophers carried on in the Latin language. From the vast multitude of epistles left by Erasmus, and some other eminent men of the same period, we may form some notion of the great portion of time which must have been taken up in this kind of correspondence. Even after every possible exertion, knowledge could be very imperfectly diffused by such means. Hence another important purpose of

these associations was to publish, periodically, all the discoveries which came to their knowledge. It is to these societies, therefore, that we are indebted for the present facility with which knowledge of every kind is diffused over the world: the memoirs and transactions, and the monthly publications, which issue from the press in such numbers in most European countries, render it now an easy matter to make oneself acquainted with every improvement in any branch of science almost as soon as it takes place. Formerly, a philosopher could not well appear before the world, unless he had a complete treatise to publish. But at present, through these periodical channels, every idea and new fact may be easily and advantageously communicated. 'The experimenter runs but little risk of losing his labour by investigating what has been already ascertained; while, by the multiplicity of co-operators, emulation and industry are more likely to be maintained¹.'

The period at which the Royal Society was incorporated was peculiarly favourable for the progress of science in this country. During many years a civil war had called into action the energy and ability of the various partizans: the parliament, which at first had gained the ascendancy, was obliged to yield to the military usurpation of Cromwell: during a few years, his energy and abilities enabled him to resist all opposition; but after his death the kingdom threatened to fall into complete anarchy, when the sudden restoration of Charles II. healed all divisions and terminated all revolutionary violence. 'Then was a favourable time to draw the attention of the rich and the well-informed to the improvement of science, and to direct the effervescence of over-active minds to the advancement of knowledge, instead of political speculations.'

The number of eminent men at this time in England who were disposed to associate for this important purpose was unusually great. The mathematical sciences, and astronomy in particular, had numerous cultivators.

¹ Dr. Thomson, *History of the Royal Society*.

The society, which from its very commencement had attracted the attention of all the scientific men of Europe, was now destined to receive the patronage of royalty; for, having presented an address to the king, on his restoration, his majesty expressed much satisfaction that such an institution had originated in his reign, and promised to support it with his influence. And in the year 1662, by the concurrence, it is said, of Lord Clarendon the chancellor, Sir Geoffry Palmer the attorney-general, and Sir Heneage Finch the solicitor-general, his Majesty granted a charter, dated 15th July, constituting the members a body corporate, under the name of the Royal Society, appointing Lord Viscount Brouncker the first president, Dr. Wilkins and Mr. Oldenburg the first secretaries, William Balle, Esq. treasurer, and twenty-one of the most respectable members the first council. This council was empowered by the charter to nominate, during a period of two months, what persons they thought proper as members of the society; after which all elections were to be conducted by the society in a body, and every candidate, in order to be admitted, was to have the votes of two-thirds of the members present.

In this charter no provision was made for carrying on the business of the society by a vice-president, and being in many other respects not sufficiently explicit, a second charter was applied for, and granted on the 22d April, 1663. As this document is one of great importance in the history of science, the following abstract of it, by Dr. Sprat, will be read with interest:—

CHARLES THE SECOND, by the grace of God, of England, Scotland, France, and Ireland, King, Defender of the Faith, &c. To all unto whom these presents shall come, Greeting. Having long resolved within ourself to promote the welfare of arts and sciences, as well as that of our territories and dominions, out of our princely affection to all kind of learning, and more particular favour to philosophical studies; especially those which endeavour, by solid experiments, either to reform

or improve philosophy : To the intent, therefore, that these kinds of study, which are nowhere yet sufficiently cultivated, may flourish in our dominions ; and that the learned world may acknowledge us to be, not only the defender of the faith, but the patron and encourager of all sorts of useful knowledge ;

KNOW YE, that we, out of our special grace, certain knowledge, and meer motion, have given and granted, and do by these presents give and grant, for us, our heirs, and successors, that there shall be for ever a Society, consisting of a President, Council, and Fellows, which shall be called by the name of the President, Council, and Fellows of the Royal Society of London, for and improving of natural¹ knowledge, of which Society we do by these presents declare ourself to be Founder and Patron. And we do hereby make and constitute the said Society, by the name, &c. to be a body corporate, to be continued under the same name, in a perpetual succession, and that they and their successors (whose studies are to be employed for the promoting of the knowledge of natural things and useful arts, by experiments, to the glory of God, and the good of mankind) shall, by the aforesaid name of President, Council, &c. be enabled to make capable in law, to levy, hold, possess, and enjoy lands, tenements, &c. liberties, franchises, jurisdictions, for perpetuity, or terms of lives, or years, or any other way ; as also goods, chattels, and all other things, of what nature or kind soever. And, also, by the name aforesaid, to give, grant, demise, or assign the said lands, goods, &c. and to do all things necessary thereabout. And the said persons, by the

¹ Dr. Paris says, ' This epithet *natural* was originally intended to imply a meaning of which very few persons, I believe, are aware. At the period of the establishment of the Society the arts of witchcraft and divination were very extensively encouraged ; and the word *natural* was therefore introduced, in contradistinction to *super-natural*.

' Although Sir William Scott, in his *Demonology*, alludes to the influence of this Society in diminishing the reigning superstition, he does not appear to have been acquainted with the circumstance here alluded to.'

name aforesaid, are enabled to implead, be impleaded, sue, defend, &c. in any courts, and before any judges, officers, &c. whatsoever, of the king, his heirs, and successors, in all and singular actions, real and personal, pleas, causes, &c. of what kind soever, as any of his subjects within his kingdom of England, or corporations, are by law capable and enabled to do.

And the said President, Council and Fellows, are empowered to have a common seal for their use in their affairs; and from time to time to break, change, and make anew the same, as shall seem expedient unto them.

And his Majesty, in testimony of his royal favour towards the said President, Council and Fellows, and of his especial esteem of them, doth grant a coat of arms to them and their successors, namely, on a field argent a canton of the three lyons of England: for a crest, an eagle proper on a ducal coronet, supporting a shield charged with the lyons aforesaid; and for supporters two talbots with coronets on their necks. The said arms to be borne &c., by the said Society upon all occasions.

And that his Majesty's royal intention may take the better effect for the good government of the said Society from time to time; It is established that the council aforesaid shall consist of twenty-one persons (whereof the President for the time being always to be one). And that all persons which within two months next ensuing the date of the said charter, shall be chosen by the said President and Council; and in all times after the said two months, by the President, Council and Fellows, and noted in a register to be kept for that purpose, shall be fellows of the said Society, and so accounted and called during life, except by the statutes of the said Society to be made any of them shall happen to be amoved. And by how much any persons are more excelling in all kinds of learning, by how much the more ardently they desire to promote the honour, business, and emolument of the said Society, by how much the more eminent they are for integrity, honesty, piety, loyalty and good affection towards his Majesty, his crown, and dignity, by so much

the more fit and worthy such persons are to be judged for reception into the Society.

And for the better execution of his royal grant, his Majesty hath nominated &c., his trusty and well-beloved William Viscount Brouncker, chancellor to his dearest consort Queen Catharine, to be the first and modern President, to continue in the said office from the date of the patent to the feast of St. Andrew next ensuing, and until another person of the said Council be duly chosen into the said office. The said Lord Brouncker being sworn in all things belonging thereto well and faithfully to execute the said office, before his right well-beloved and right trusty cousin and counsellor Edward Earl of Clarendon, Lord High Chancellor of England, in the words following:

I William Viscount Brouncker do promise to deal faithfully and honestly in all things belonging to that trust committed to me, as President to the Royal Society of London, for improving natural knowledge. So help me God.

And his Majesty hath nominated &c., the persons following;—his trusty and well-beloved Sir Robert Moray, Knight, one of his Privy Council in his kingdom of Scotland; Robert Boyle, Esquire; William Brereton, Esquire, eldest son to the Lord Brereton; Sir Kenelme Digby, Knight, Chancellor to his dearest mother, Queen Mary; Sir Gilbert Talbot, Knight, Master of his jewel-house; Sir Paul Neile, Knight, one of the Ushers of his Privy Chamber; Henry Slingsby, Esquire, one of the Gentlemen of his said Privy Chamber; Sir William Petty, Knight; Timothy Clark, Doctor of Physic, and one of his physicians; John Wilkins, Doctor of Divinity; George Ent, Doctor of Physic; William Erskyne, Esquire, one of his cupbearers; Jonathan Goddard, Doctor of Physic; William Ball, Esquire; Matthew Wren, Esquire; John Evelyn, Esquire; Thomas Henshaw, Esquire; Dudley Palmer, of Gray's Inn, Esquire; Abraham Hill, of London, Esquire, and Henry Oldenburg, Esquire, together with the President aforesaid, to be the first and modern twenty-one of the Council and Fellows

of the Royal Society aforesaid, to be continued in the offices of the Council aforesaid, from the date of the patent to the feast of St. Andrew next following, and from thence till other fit persons be chosen into the said offices. The said persons to be sworn before the President of the Society for the time being, well and truly to execute the said offices, according to the form and effect of the aforesaid oath, to be administered to the President by the Lord Chancellor as aforesaid. And the said persons duly sworn, and all other from time to time duly chosen into the said council and sworn, are to aid, advise, and assist in all affairs, businesses, and things concerning the better regulation, government, and direction of the Royal Society and every member thereof.

Furthermore liberty is granted to the said Society lawfully to make and hold meetings of themselves, for the searching out and discovery of natural things and transaction of other businesses relating to the said Society, when and as often as shall be requisite, in any college, hall, or other convenient place in London, or within ten miles thereof.

The other matters provided for in these letters patent, are the election of officers on St. Andrew's day, or at other times should vacancies occur;—the appointment of a Vice-President with full powers to act in case the President be sick, infirm, detained in his Majesty's service, or otherwise occupied so that he cannot attend the necessary affairs of the Society;—power is also granted to the Society to establish laws, statutes and orders for the regulation and government of the Society;—the Society is also empowered to choose their own printer and engraver, and to administer to them the above-mentioned oath;—they are also empowered to claim the bodies of persons executed, and 'to anatomise the same, for the greater advantage and success of the Society in their philosophical studies and endeavours.' The Society is also empowered to erect one or more colleges within London or ten miles thereof for the uses of the Society. 'If any abuses or differences shall arise about the

government or affairs of the Society, whence the constitution, progress and improvement or businesses thereof may suffer or be hindered; such differences or abuses to be composed and redressed by the Archbishop of Canterbury, the Lord Chancellor of England, the Lord High Treasurer of England, the Lord Keeper of the Privy Seal, the Lord Bishop of London, and the two principal Secretaries of State for the time being, or any four or more of them.'

At this time the society continued to hold its meetings in Gresham College. We gather some particulars respecting them from Mr. Sorbière, historiographer to Louis XIV. who in the year 1663 visited England. In a series of letters published on his return to France, he describes his journey, and among other things a visit to the Royal Society. A translation of these letters, with comments, was published by Dr. Sprat in 1709, from which we select the following passages.

M. Sorbière was introduced to the society by Sir Robert Murray, who, he says, 'had the goodness, almost every time that I attended there, to seat me next himself, that so he might interpret to me whatever was said in English. I remember the first time that I was there, a country gentlemen made a very handsome discourse concerning the diseases of corn, and recounted about an hundred curious observations he had made upon the seed before it was sown, upon the plant before it was reaped, and upon the ear till reduced to meal. He spoke of a certain grain of a vast bigness that suddenly sprouted out into ear, like an excrescence, and is a sort of poison which might cause epidemical distempers, of which we are not yet aware. But seeing we are now come to the Royal Society, it is proper we should say something of it, till such time as we have the history of its foundation for our fuller information, of which we have some expectation¹.

¹ The writer alludes to the *History of the Royal Society*, by Dr. Sprat, afterwards Bishop of Rochester, published in the year 1667.

‘The Royal Society of London is founded by King’s Letters Patent, who gave them Gresham college, (built by a merchant of that name in Bishopsgate-street¹), where they met every Wednesday. I do not know whether there is any revenue yet settled for the maintenance of those persons who manage the machines, and for an usher or beadle, who goes before the president with a mace², which he lays down on the table when the society have taken their places; but I have been informed that they afterwards settled a fund of four thousand livres for the maintenance of two learned men in the college whose business it was to give the society an account of what was contained in those books they would have read by them, and to this end they have already begun a library adjoining to a gallery, through which they go out of the hall where the society meets: as you have on the other side and before the same hall a very handsome antichamber, and two more, in one of which the council is held; without reckoning the lodgings appointed for the two professors, who out of ancient authors collect natural and mechanical experiments, which are examined in order to ascertain the truth or falsehood of them to posterity, whilst they in like manner make new ones of their own.

‘The room where the society meets is large and wainscotted; there is a large table before the chimney with seven or eight chairs covered with green cloth about it, and two rows of wooden and naked benches to lean on, the first being higher than the other, in form like an amphitheatre. The president and council are elective; they mind no precedence in the society, but the president sits at the middle of the table in an elbow-chair, with his back to the chimney. The secretary sits

¹ In M. Sorbière’s work there is an amusing instance of the difficulty which most Frenchmen have in writing English proper names. He calls Bishopsgate-street ‘la rue Biscop getstriidt.’

² This mace was bestowed upon the society by Charles II. in 1663, and is still in their possession. It is the identical mace referred to by Cromwell when he expelled the Commons from the house of Parliament, and bade his soldiers ‘Take away that bauble.’

at the end of the table on his left hand, and they have each of them pen, ink, and paper before them. I saw nobody sit on the chairs; I think they are reserved for persons of great quality, or those who have occasion to draw near to the president. All the other members take their places as they think fit, and without any ceremony; and if any one comes in after the society is fixed, nobody stirs, but he takes a place presently where he can find it, that so no interruption may be given to him that speaks. The president has a little wooden mace in his hand, with which he strikes the table when he would command silence. They address their discourse to him bareheaded, till he makes a sign for them to put on their hats; and there is a relation given in a few words of what is thought proper to be said concerning the experiments proposed by the secretary. There is nobody here eager to speak, that makes a long harangue, or intent upon saying all he knows. He is never interrupted that speaks, and differences of opinion cause no manner of resentment, nor as much as a disobliging way of speech. There is nothing seemed to me to be more civil, respectful, and better managed than this meeting; and if there are any private discourses held between any while a member is speaking, they only whisper, and the least sign from the president causes a sudden stop, though they have not told their mind out. I took special notice of this conduct in a body consisting of so many persons, and of such different nations; for they admit them all into their society; and lay no other obligation upon them than to sign an instrument by which they promise to observe the statutes of the society; to be present as often as they can at their meetings, and especially those wherein they choose officers; to do or say nothing that may injure the society; to honour and promote all they can the interests of the same as long as they are willing to continue members of it; and such they are reputed to be till they have made a renunciation of their title in writing. They did me the honour to admit me to take that oath, and I very readily signed the instrument, at the same time

that another was prepared for the King, by which his Majesty promised to protect the society of which he called himself the founder. I have pointed out to you, Sir, the disposition of this society, and you may readily guess whether any sceptics are welcome here. Their arms are a field argent representing a blank paper, and their disinclination to all sorts of prejudices, with this device, *Nullius in Verba*. In short, it cannot be discerned that any authority prevails here; and whereas those who are mere mathematicians favour Descartes more than Gassendus, the literati on the other side are more inclined to the latter. But both of them have hitherto demeaned themselves with so much moderation, that no different hypothesis or principles have been a means to break in upon the good harmony of the society, who know very well they aim at the same thing, though they pursue it by different ways, seeing they all desire to have the same phenomena explained.

‘I shall say nothing to you particularly, Sir, of those excellent persons I saw in this assembly, because I will not undertake the work of making eulogies, as I must be obliged to do if I should name them. Besides, I have not had the good fortune to be more particularly acquainted with them all, nor time to visit and have some conversation with them. I am in doubt, if I had attempted it, whether I should have succeeded well, because the English live very retiredly, and have little communication with strangers; and being averse to the speaking of French, though they can do it very well, they speak Latin with such an accent and way of pronunciation that they are as hard to be understood, as if they spoke their own language.’

It is curious to notice the proceedings of the society during the first few years of its establishment. The science of the age was mixed up with, and disfigured by, many of the errors of alchemy and astrology; facts were frequently observed with the eye of prejudice or superstition; and the marvellous relations of credulous travellers were thought worthy of examination: all which may, in some degree, account for, and excuse the trivial nature

of many of the society's early proceedings. Thus, in the minutes of the society's proceedings, such entries as the following occur :—

‘1661, March 25th. Mr. Boyle was requested to report the name of the place in Brazil where that wood is which attracts fishes ; and of the fish which turns to the wind when suspended by a thread.

‘July 24th. A circle was made with powder of unicorn's horn, and a spider set in the middle of it, but it immediately ran out. The trial being repeated several times, the spider once made some stay on the powder.

‘1663. March 25th. Dr. Croune suggested that the viper-powder, formerly committed to the care of Mr. Pulleyn, might be looked after ; and that Mr. Pulleyn should be desired to observe the proper time wherein it was thought that vipers would be produced out of that powder.

‘1663. Dec. 23. Occasion being given to discourse of tormenting a person with the sympathy powder, Dr. Wren related that in the house of a kinsman of his, the experiment had been tried by him upon a servant who had grievously cut her finger ; and a rag rubbed upon the wound being dressed with calcined vitriol, and put into the maid's bosom, her finger within a short time was cured. Whereupon he had taken the rag from her, and heated it upon the fire whilst the maid was sweeping the next chamber ; who, upon a sudden, flung away the broom, and cried out for the pain in the finger ; which being looked to, was found very fiery ; upon which they cooled the rag again and dressed it as formerly, and within a day or two the finger was entirely cured.

‘Mr. Boyle undertook to try this experiment upon a dog.’

But if such passages as the above excite a smile, there are others, even among these early occupations of the society, to remind us of scientific labours which deserve our highest admiration and warmest gratitude : for example :—

‘167 $\frac{1}{2}$. Jan. 11. Mr. Isaac Newton was elected.’

On this occasion a letter from Newton, on his improvement of telescopes, was read; the following is the concluding passage:—

‘I am very sensible of the honour done me by the Bishop of Sarum in proposing me candidate, and which I hope will be further conferred upon me by my election into the society. And, if so, I shall endeavour to testify my gratitude, by communicating what my poor and solitary endeavours can effect towards the promoting philosophical design.’

‘It was ordered that a letter should be written by the secretary to Mr. Newton, to acquaint him of his election into the society, and to thank him for the communication of his telescopes, and to assure him that the society would take care that all right should be done him with respect to this invention.’

‘167 $\frac{1}{2}$. Feb. 8. A letter was read of Mr. Isaac Newton from Cambridge, 6 Feb. 167 $\frac{1}{2}$, concerning his discovery of the nature of light, refractions, and colours; importing that light is not a similar, but a heterogeneous body, consisting of different rays, which had essentially different refractions, abstracted from bodies through which they pass; and that colours are produced from such and such rays, whereof some in their own nature are disposed to produce red, others green, others blue, others purple, &c., and that whiteness is nothing but a mixture of all sorts of colours, or that it is produced by all sorts of colours blended together.

‘It was ordered, that the author be solemnly thanked, in the name of the society, for this very ingenious discourse, and be made acquainted, that the society think very much of it, if he consent to have it forthwith published, as well for the greater convenience of having it well considered by philosophers, as for securing the considerable notions of the author’s against the pretensions of others.

‘It was ordered also that this discourse be entered into the register-book; and that the Bishop of Salisbury,

Mr. Boyle, and Mr. Hooke, be desired to peruse and consider it, and bring in a report of it to the society.

‘Feb. 15. Mr. Hooke’s considerations upon Mr. Newton’s discourse on light and colours were read. Mr. Hooke was thanked for the pains taken in bringing in such ingenious reflections; and it was ordered that this paper should be registered, and a copy of it immediately sent to Mr. Newton: and that in the mean time the printing of Mr. Newton’s discourse by itself might go on, if he did not contradict it; and that Mr. Hooke’s paper might be printed afterwards, it not being thought fit to print them together, lest Mr. Newton should look upon it as a disrespect, in printing so sudden a refutation of a discourse of his which had met with so much applause at the society but a few days before.

‘Feb. 22. Mr. Newton’s letter to Mr. Oldenburg, dated at Cambridge, Feb. 20, 167 $\frac{1}{2}$, was read, promising an answer to Mr. Hooke’s observations upon his new theory of light and colour. It was as follows:—

‘I received yours, Feb. 17, and, having considered Mr. Hooke’s observations on my discourse, am glad that so acute an objector hath said nothing that can enervate any part of it: for I am still of the same judgment, and doubt not, but that upon severer examinations it will be found as certain a truth as I have asserted it. You shall very suddenly have an answer.’

From the time when the Society received its charter, its proceedings gradually rose in importance. In the year 1664 Mr. Hooke was appointed curator, with a salary of eighty pounds per annum. The instruments under his charge, as well as a museum of natural curiosities, to which additions were being constantly made, were preserved in the west gallery of Gresham College. Sir John Cutler also settled fifty pounds a year on Mr. Hooke, upon condition of his delivering a course of sixteen lectures every year, ‘in order to the advancement of art and nature,’ under the regulation of the society. About this time also the society formed itself into eight committees, for the purpose of considering the different subjects of which it was cognizant. These were

‘1. Mechanical, to consider and improve all mechanical inventions. 2. Astronomical and optical. 3. Anatomical. 4. Chemical. 5. Georgical. 6. For histories of trade. 7. For collecting all the phenomena of nature hitherto observed, and all experiments made and recorded. 8. For correspondence.’

Between the years 1661 and 1664 the king visited the society several times, on which occasions experiments were exhibited, for the preparation of which committees of the members were appointed. At a meeting of the society 11th January, 1665, ‘the charter-book of the society was produced, wherein his Majesty on the 9th January had written himself “CHARLES R. FOUNDER,” and his highness the Duke of York “JAMES, Fellow;” the Duke of Albemarle also having entered his name at the same time. The president was desired to kiss his Majesty’s hand for this honour.’

The custom of exhibiting experiments before distinguished visitors seems to have been adopted early by the society. Thus we read in a minute of the 13th Feb. 1661, that ‘the Danish ambassador visited the society, being introduced by Mr. Evelyn, and was entertained with experiments on Mr. Boyle’s air-pump, &c.’

Sometimes experiments thus exhibited are enumerated at length, thus:—

‘1667. May 23. It was resolved, that the Duchess of Newcastle having intimated her desire to be present at one of the meetings of the society, be entertained with some experiments at the next meeting; and that the Lord Berkeley and Dr. Charleton be desired to give notice of it to her Grace, and to attend her to the meeting on the Thursday following.

‘It was ordered, that for the said entertainment there be made ready the experiments of colours formerly mentioned by Mr. Boyle; the weighing of air in an exhausted receiver; the dissolving of flesh with a certain liquor of Mr. Boyle’s suggesting, &c.

‘May 30. The Duchess of Newcastle coming in, the experiments for her entertainment were made:

‘First, that of weighing the air, which was done

with a glass receiver of the capacity of nine gallons and three pints; which being exhausted, and put into a scale, and then opened and the air let in, weighed thereupon one ounce and seventy one carats more than it did when exhausted.

‘Next were made several experiments of mixing colours.

‘Then two cold liquors by mixture made hot.

‘Then the experiment of making water bubble up in the rarefying engine, by drawing out the air; and that of making an empty bladder swell in the same engine.

‘Then the experiment of making a body swim in the middle of the water.

‘And that of two well-wrought marbles, which were not separated but by the weight of forty-seven pounds.’

This method of entertaining distinguished visitors was quite in accordance with the earlier objects of the society. Their great object being to promote experimental science, it was usual, during many years after its first establishment, to exhibit experiments at every meeting; and a person was appointed, at a fixed salary, to contrive suitable experiments for exhibition. Mr. Boyle, Dr. Hooke, Dr. Grew, and others, sometimes repeated before the society experiments already made in private. In this way knowledge was spread rapidly; the spectators were made acquainted with the right method of investigation, and taught how to draw legitimate consequences from their observations.

The society seem at an early period to have contemplated the publication of their proceedings in the form of a journal. It is with no common interest that we read such a minute as the following:—

‘1664 $\frac{4}{5}$. March 1. It was ordered that the *Philosophical Transactions*, to be composed by Mr. Oldenburg, be printed the first Monday of every month, if he have sufficient matter for it; and that that tract be licensed by the council of the society, being first reviewed by some of the members of the same; and that the president be desired now to license the first papers thereof,

being written in four sheets in folio, to be printed by John Martyn and James Allestry, printers to the society."

The first number of the *Philosophical Transactions* was accordingly published, with the date, 'Monday, March 6, 1664¹.' It consists of sixteen small quarto pages, the contents of which are as follows:—'1. A short introduction. 2. An accompt of the improvement of optick-glasses. 3. Notice of a spot in one of the belts of Jupiter. 4. The motion of the late comet predicted. 5. An experimental history of cold. 6. An account of a very odd monstrous calf. 7. Of a peculiar lead-ore of Germany, and the use thereof. Of an Hungarian Bolus, of the same effect with the Bolus Armenus. 9. Of the new American whale-fishing about the Bermudas. 10. A narrative concerning the success of pendulum-watches at sea, for the longitudes. 11. The character, lately published beyond the seas, of an eminent person, not long since dead at Thoulouse, where he was a counsellor of parliament¹.'

It was the intention of the society that one such number should be published on the first Monday of every month, or less frequently, according as materials were supplied. They contained many of the papers which had been read before the society, with additional information to the subject of each paper supplied by the editor. Analyses of books of science were also inserted, a practice which greatly promoted the spread of knowledge, and the introduction of works of merit.

About the time of the publication of the fifth number (June 1665), the public meetings of the members were discontinued, on account of the plague which then raged. At the close of the fifth number is an advertisement, that, 'by reason of the present contagion in London, which may unhappily cause an interruption, as well of *correspondencies* as of *public meetings*, the printing of these *Philosophical Transactions* may possibly for a while be intermitted, though endeavours shall

¹ M. de Fermat, author of several Mathematical Treatises.

be used to continue them, if it may be.' On the 10th August, Mr. Oldenburg wrote to Mr. Boyle that 'he had put all his affairs and papers in order, separating what belonged to the Royal Society from his own, intending, at the very beginning of his indisposition, if he should be seized, to have these papers conveyed to an healthy place.' In another letter, of the 24th August, he returns his acknowledgments to Boyle for imparting to him somewhat of his philosophical employments at Oxford, and expresses his satisfaction that some other members of the Royal Society were active also, and likely to give a good account of their spent time at their meeting again.

From the experiments made by Mr. Boyle, and some of the other members at Oxford, three more numbers of the Transactions were formed, and published at Oxford, but the ninth and all the succeeding numbers came out in London.

On the 21st of February, 1666, the plague having abated, the council of the Royal Society again met in the usual place in Gresham College; but their meetings were destined to be again disturbed by another public calamity, namely, the great fire which reduced nearly all London to ashes. The authorities of the city being compelled to take possession of the rooms hitherto occupied by the society, the latter gratefully accepted the offer made by Mr. Henry Howard, of Norfolk, (afterwards Earl-Marshal of England), of apartments in Arundel-house.

The great fire also interfered with the publication of the Transactions. The printers of the Royal Society, and the publishers in St. Paul's Church-yard, lost all their stock of books in the fire, after having removed them from their own houses into St. Faith's Church; and among these were all the printed unsold copies of the Transactions. In one of his letters to Mr. Boyle, Mr. Oldenburg complains that he could get none to print the *Philosophical Transactions*; 'and unless,' he says, 'Mr. Crook (whom I do what I can to encourage to it by promising him that I will endeavour the best I

can to procure for him the printing some good vendible books, as occasion shall serve) undertake it, I despair of the continuation.' No. 17 was printed after the fire gratis.

In the course of the year 1666, however, the numbers of the *Philosophical Transactions* were collected into a volume, entitled, *Philosophical Transactions, giving some Accompt of the present Undertakings, Studies, and Labours of the Ingenious, in many considerable parts of the World. Vol. I. For Anno 1665 and 1666. In the Savoy, Printed by T. N. for John Martyn, at the Bell, a little without Temple Bar, and James Allestry, in Duck-lane, printers to the Royal Society.* This volume is dedicated to the Society, by their secretary, Mr. Henry Oldenburg, in the following terms :—

‘TO THE ROYAL SOCIETY.

‘It will not become me to adde any Attributes to a Title, which has a Fulness of Lustre from his Majesties’ Denomination.

‘In these Rude Collections, which are onely the Gleanings of my private Diversions in broken hours, it may appear, that many Minds and Hands are in many places industriously employed, under Your Countenance and by Your Example, in the pursuit of those Excellent Ends, which belong to Your Heroical Vndertakings.

‘Some of these are but the Intimations of large Complements. And some Eminent Members of Your Society have obliged the Learned World with incomparable Volumes, which are not herein mention’d, because they were finisht, and in great Reputation abroad, before I entred upon this Taske. And no small Number are at present engaged for those Weighty Productions, which require both Time and Assistance, for their due Maturity. So that no man can from these glimpses of Light take any just Measure of Your Performances, or of Your Prosecutions; but every man may perhaps receive some benefit from these Parcels, which I guessed to be somewhat conformable to Your Design.

‘This is my Solicitude. That, as I ought not to be

unfaithful to those Counsels you have committed to my Trust, so also that I may not altogether waste any minutes of the leasure you afford me. And thus have I made the best use of some of them, that I could devise; To spread abroad Encouragements, Inquiries, Directions, and Patterns, that may animate, and draw on Universal Assistances.

'The Great God prosper you in the Noble Engagement of Dispersing the true Lustre of his Glorious Works, and the Happy Inventions of obliging men all over the World, to the General Benefit of Mankind: So wishes with real affections.

'Your humble and obedient servant,

'HENRY OLDENBURG.'

The secretary Oldenburg continued the publication of the Transactions till the period of his death, in 1677, when he had published one hundred and thirty-six numbers, completing very nearly the whole of the first twelve volumes.

In January 1667, the society met for the first time in Arundel-house. Their munificent benefactor, Mr. Howard, at the same time presented them with the library which had been purchased by his grandfather Thomas earl of Arundel, during his embassy at Vienna. It had formerly been part of the library established at Buda in 1485, by Matthew Corvinus, king of Hungary; and after his death, in 1490, it went into the possession of Bilibaldus Pirckheimer of Nuremburg, who died in 1530¹. This valuable library, consisting of several thousand printed volumes and numerous manuscripts, thus became the property of the society, the noble donor

¹ This library is referred to in a minute of the society dated May 9, 1666: 'Mr. Howard presented a book of Lambecius the emperor's historiographer containing an account of the emperor's library, its beginning, increase, and present state, consisting of about eighty thousand books, manuscript and printed; part of which consisted of several libraries, as that of Tycho Brahe, Kepler, Mæstlinus, and the relics of the royal Hungarian library of Buda &c., containing likewise near sixteen thousand medals, and a collection of curiosities both of nature and art.'

desiring only that in case the society should fail, the library might be returned to Arundel-house; and also that this inscription, '*Ex dono HENRICI HOWARD Norfolciensis,*' might be put upon every book; he allowing also the liberty of changing those books that were duplicate, or such as did not suit the society's purpose, for others, which exchanged books were likewise to be marked with the same inscription.

The society had long desired to have a building or college of their own, and proposed, in November 1667, to raise by subscription among its members a sum of money sufficient for the erection of a college. In the course of a few months, the sum of one thousand pounds was subscribed. Mr. Howard had generously given a piece of ground near Arundel-house for the purpose, and offered a design for the building: Dr. Christopher Wren and Mr. Hooke also gave plans; but for some cause, probably want of sufficient funds, the project was not carried out.

On several occasions, the society seem to have thought Chelsea College a fit place for their occupation. In 1664 it was resolved 'to solicit the king for a grant of Chelsea-house and the lands belonging to it,' and on the 25th of May in the same year, a petition to the King from the President, Council and Fellows of the Royal Society was presented, praying his Majesty to grant them the said house and lands, 'that your petitioners may thereby be in some measure enabled to prosecute the design for which your Majesty was pleased to constitute them a corporation.'

From some cause not explained, the prayer of this petition does not seem to have been granted until the year 1669, when by a patent dated 8th April, Chelsea College was given up to the society. On examination, the building was found to be in too dilapidated a state for use, and the distance from town being judged to be inconvenient, the society determined not to occupy it, so that it was purchased back for the king's use, for the sum of thirteen hundred pounds. In the year 1673, the society was invited by a deputation of the

professors and of the Mercer's company back to Gresham College, which now bore the name of the Royal Exchange, and they were induced to accept the offer because their apparatus and collections were deposited there, and also because Mr. Hooke their operator resided in that building. The west gallery was used as a repository, and the long gallery as a library for the reception of the books from Arundel-house¹.

It is painful to notice the loss and inconvenience to which the society was exposed during the first few years of its establishment, in consequence of the backwardness of its members in paying their very moderate subscription of one shilling per week. In the year 1667, when Dr. Sprat published his history of the Society, the number of members was about two hundred; in 1673 the number was only one hundred and forty-six, and of these seventy-nine had long neglected to pay their subscriptions. The council frequently met to consider the state of the society's funds, and to direct the most urgent applications to the defaulters, either to pay or to give a bond for payment at some future period. On the 22nd of December, 1673, it was declared 'that such of the fellows as shall neither make present payment of their respective arrears, nor give bond as aforesaid, shall be accounted to have deserted the said society, and be provided against according to the statutes: and that the society will proceed to a legal recovery of the said arrears.' It does not, however, appear that legal proceedings ever were actually adopted for the recovery of the arrears, but

¹ The books of the society are free of access to all the fellows, and may be borrowed by them under the regulations prescribed by the statutes. The society also does not object to lend books or manuscripts to learned men not belonging to their corporation. The following curious entry occurs under the date February 27, 1674: 'It was ordered that Mr. Edward Bernard, Savilian professor of Astronomy at Oxford, having desired by Mr. Hooke the loan of a Diogenes Laertius and of a Coptic Psalter out of the library bestowed upon the society by the Earl-Marshall, be accommodated with the said books for the space of a month, he giving a bond of an hundred pounds to the society to restore these books at the end of the said month, to be accounted from the date of this order.'

the society became more strict in inquiring into the characters of the persons who were proposed for admission into the society. It was found, on inquiry, that too large a number of the fellows had been excused from making any payment at all, either because they had not the means, or because they contributed to the prosperity of science by devoting their time to original inquiry. We regret to notice that on the former ground Newton claimed exemption. The following entry occurs under the date Jan. 28th, 1675: 'Mr. Oldenburg having mentioned that Mr. Newton had intimated his being now in such circumstances that he desired to be excused from the weekly payments, it was agreed to by the council, that he should be dispensed with, as several others were.'

To remedy these abuses the president, Sir Christopher Wren, in the year 1682, proposed the adoption of a statute to regulate the admission of fellows, whereby it was provided that any person proposing a candidate for admission should give his name to some member of the council: and it was to be considered at the next or at some following meeting of the council, whether the proposed candidate was likely to be useful to the society or not; the members being satisfied on this point, the candidate was to be formally proposed at the next meeting, and afterwards balloted for as usual. On his election he was to sign the statute-book, and on being admitted he was to pay the fees. In this same year a resolution was passed respecting the exemption of payments by some of the fellows. The council, 'considering that the reason of their exemption was in consideration that those members were admitted for their great abilities, to be serviceable in their experiments, or otherwise, to the society, and were therefore exempted from payment; it was ordered that for the future no persons should be exempted from payment, or left out of the treasurer's books, except foreigners. And if the members formerly exempted shall be pleased to bring in experiments at their own charge, they shall be considered, by striking off their dues in balance to their service and charge, and not otherwise.'

The society has at various times received pecuniary aid from some of its benefactors, in addition to presents of books, specimens in natural history, and scientific apparatus. In 1664 Mr. Balle gave the society one hundred pounds; and a few years after this, Dr. Wilkins, bishop of Chester, bequeathed them four hundred pounds. This sum was laid out in January 1675, in the purchase of an annual income of twenty-four pounds, from certain fee-farm-rents at Lewes in Sussex. In 1682 the sum of thirteen hundred pounds was received for Chelsea College, as already noticed; and this sum was vested in African and East Indian stock.

The society being thus in possession of a permanent income, were enabled to effect certain arrangements which contributed greatly to its welfare. The secretary, Mr. Oldenburg, up to the year 1668 received no salary, but only an occasional gratuity of fifty pounds; but in that year it was agreed to allow him the annual sum of forty pounds. After his death, in 1677, two paid secretaries were appointed; but on one occasion, the two secretaries happening both to resign at the same time, the council, in order to prevent the recurrence of such an inconvenience, 'thought it expedient to have only honorary secretaries, and a clerk, or amanuensis, upon whom the whole burthen of the business should lie: and to give him a fixed salary, so as to make it worth his while, and he to be accountable to the secretaries for the performance of his office.' Sir John Hoskyns and Dr. Gale were elected the first two honorary secretaries, and in January 1686 Mr. Edmund Halley was appointed the paid secretary, with the yearly salary of fifty pounds.

Previous to this election the council agreed upon certain qualifications which they deemed necessary for their paid secretary, and entered them in their minutes in the following form:—

1. Resolved, that if a fellow of the society be chosen into the office of clerk, he shall, before his admission to his office, resign his fellowship.

2. If any person other than a fellow shall be chosen

clerk, he shall be incapable of being chosen a fellow; while he holdeth the office of clerk.

3. That he shall have no other employment.

4. That he shall constantly lodge in the college where the society meeteth.

5. That he shall be a single man without children.

6. That he shall obey all orders from the president, council, or secretaries.

7. That he shall be master of the English, French, and Latin tongues.

8. That he shall be able to write a fair and legible hand.

9. That he shall be completely seen in the mathematics and experimental philosophy.

10. That all letters of philosophical correspondence shall be signed by one of the secretaries, and not by the clerk.

11. That the clerk shall be accountable to the council for the performance of his office, as it shall be from time to time appointed to him.

12. That his salary for copying, entering, and the performance of all other parts of his office, shall be after the rate of fifty pounds per annum at the least, he being found as above, and performing his duty to the satisfaction of the council.

The duty of the clerk.

1. He shall take the minutes of the society in a book, and not in loose papers.

2. He shall draw up the minutes at large against the next meeting.

3. He shall enter the minutes after they have been read at the board in the journal-books.

4. He shall draw up all letters, and bring them to be signed by one of the secretaries.

5. He shall index the books of the society.

6. He shall keep a catalogue of all the gifts to the society.

CHAPTER II.

HISTORICAL NOTICE OF THE ROYAL SOCIETY, CONTINUED UP TO THE PRESIDENCY OF SIR JOSEPH BANKS.

Opposition to the Society—Dr. Sprat's Defence—Progress of the *Philosophical Transactions*—Removal of the Society to Crane-court, Fleet-street, and afterwards to Somerset-house—Sir Isaac Newton elected President—A Committee appointed to superintend the publication of the *Philosophical Transactions*—Sir John Hill's Strictures—Specimen thereof—Improvement in the Character of the Transactions—The Dispute concerning Electrical Conductors—Presentation of Medals by the Society—Lord Brouncker's Medal—Dame Lady Sadleir's Lecture—The Bakerian Lecture—Sir Godfrey Copley's Medal—The Rumford Medals—George the Fourth's Medals—Sir John Pringle introduces the Practice of pronouncing a Discourse on the Assignment of a Medal.

THE early progress of the society was not only impeded by straitened means, but also by the attacks of some persons who felt or affected to feel that its existenece was dangerous to society. The chief opponents of the society were Dr. Henry Stubbe, a physician at Warwick, and the Rev. Robert Crosse, of Somersetshire. They attacked the society with great fierceness, charging its members with neglecting the wisdom of the ancients, and submitting to the guidance of their own unassisted judgments;—that by admitting as fellows men of all countries, the stability of the established church was endangered;—that philosophy founded on experiment was likely to lead to atheism;—that the society was undermining the universities, favouring popery, and introducing novelty into everything. Dr. Sprat, afterwards bishop of Rochester, published in 1667 his *History of the Royal Society*, in which he admits

distinctly that the object of the society is the promotion of philosophy by experiment, and by the observation of natural phenomena. He declares that the society reveres the ancients, and willingly subscribes to and adopts their opinion in matters which are probable only; but he claims for the society the right of judging from facts, as the Greeks did when they received the learning of the Egyptians, but rejected their superstitions. He states that the early members of the society who first met at Oxford assisted in forming a race of young students, whose minds became imbued with a taste for natural knowledge; and that by their influence, the discipline of the university was preserved from the spiritual frenzy which then prevailed in the kingdom. In answer to the charge of introducing novelty he says:—‘If all things that are new be destructive, all the several means and degrees by which mankind has risen to this perfection of arts were to be condemned. If to be the author of new things be a crime, how will the first civilizers of men, and makers of laws, and founders of governments, escape? Whatever now delights us in the works of nature that excels the rudeness of the first creation, is new. Whatever we see in cities or houses, above the first wildness of fields, and meanness of cottages, and nakedness of men, had its time when this imputation of novelty might as well have been laid to its charge. It is not therefore an offence to profess the introduction of new things, unless that which is introduced prove pernicious in itself, or cannot be brought in without the extirpation of others that are better.’

After the death of Mr. Oldenburg, Dr. Grew was appointed secretary: he published No. 137 of the *Philosophical Transactions*, and continued to be editor during two years. His successor was Dr. Hooke; but the publication of the *Transactions* was discontinued during three years, in consequence of their very limited sale, and the small profits which accrued to the editor. In 1681, Dr. Hooke began to publish what he called *Philosophical Collections*, which were acknowledged by the society, and have always been considered as forming

a portion of the *Transactions*, though under a different name. Seven numbers of these *Collections* were published in 1681 and 1682. In 1683, Dr. Plot, who had succeeded Dr. Hooke as secretary, undertook to revive the publication of the *Transactions*, on condition that the society would undertake to purchase sixty copies of each number. Dr. Plot was editor during the years 1683 and 1684, and published the 13th and 14th volumes.

The 15th volume was edited by Mr. William Musgrave, who was appointed secretary in 1685; but this volume seems to have been received with some dissatisfaction. The materials were probably deficient, for it appears from the registers of the society, that Dr. Edmund Halley offered, on the renewal of the publication, to furnish one fourth of the whole out of his own private stock. Dr. Halley seems to have been editor of the 16th volume, published during the years 1686 and 1687, after which there was no publication during three years, on account of deficiency of materials. In 1691 the publication was revived, and though Dr. Halley was not the ostensible editor, he appears to have been its active superintendent up to the period of his voyage to the southern hemisphere in 1698. Vols. 17 and 18 seem to have been edited by Mr. Waller the secretary. The ostensible editor of all the volumes from the 19th to the 28th inclusive, published between the years 1695 and 1713, was Sir Hans Sloane, who had been chosen secretary in 1693. Dr. Halley, chosen secretary in 1713, was the editor of the 29th and 30th volumes. From this period up to the 46th volume the secretaries and editors were Dr. Jurin, Dr. Rutty, and Dr. Cromwell Mortimer.

In the year 1701 the society removed from Gresham College to a spacious house which it had purchased in Crane-court, Fleet-street. The chief reason for removal seems to have been the great distance of the College from the residences of most of the members. This house in Crane-court was sufficiently spacious to contain the library and the museum. The

society continued to meet here, to read papers, and to perform experiments, until the year 1782, when the Government furnished them with apartments in Somerset-house, which they continue to occupy. On removing to these apartments it was necessary to dispose of the museum for want of room: the whole of its contents was therefore given to the British Museum. This inconvenience is now obviated, for in the year 1826 the rooms formerly used by the commissioners of the lottery were given up to the society.

In the year 1703 Sir Isaac Newton was elected president of this society, and he was annually re-elected during the remaining twenty-five years of his life. The papers on telescopes, and on light and colours, communicated by Newton to the society, first contributed to give value to the Transactions; and the society shewed the esteem in which they held the author by publishing in 1686, at its own expense, the first edition of the *Principia*, though the revenue of the society was not equal to its expenditure; for at the end of the following year a part of the society's east Indian stock was sold to discharge its debts.

The *Philosophical Transactions* continued to be edited and published by the several secretaries, the society never interesting itself further in that matter than by licensing the publication, and occasionally recommending its revival when it appeared to be suspended. But in the year 1752 a committee was appointed to consider the papers which were read before the society, and to select such as should be judged most proper to appear in the future Transactions. This practice has been followed ever since; the society however constantly declares that it never, as a body, gives its opinion on any subject, whether of nature or art which comes before it; the facts and reasonings stated in their papers resting entirely on the credit and judgment of their respective authors.

From the time when this committee was called into existence, the *Transactions* have been published in half volumes. During the first twelve years only one half

volume was published annually ; but from the year 1762 a volume has been completed every year.

The appointment of this committee was no doubt greatly influenced by the trivial nature of many of the papers which had been published, and the ridicule with which they had been treated by some persons who look upon philosophy as a fair butt at which to direct the shafts of their wit. Although this committee was likely to produce a better selection of papers for publication than would be made by the secretary alone, yet the nature of the papers read before the society, and of course the value of the Transactions published, were considerably influenced by the president. During the presidency of Martin Folkes, Esq., many of the papers were of a trifling puerile nature ; these were made the subject of ridicule by Sir John Hill, who devoted a quarto volume of 268 pages to an attempt to cast ridicule upon the labours of an illustrious body, in consequence, it is said, of being disappointed in an attempt which he had made to be elected a fellow. In the preface to his book Sir John Hill formally denies the truth of this report. Dr. Thomson admits that he has selected and exposed a variety of trifling and absurd papers ; but that his own humour is coarse and poor, and, in more instances than one, the statements contained in the papers which he attempts to ridicule are much more accurate than his own. As a specimen of the style which pervades the whole book, we select his notice of a paper by Mr. Wm. Arderon, on the method of *keeping of small fish in glass jars*. There is certainly nothing in the paper which entitled it to publication in the Transactions of a learned body ; the object being merely to watch the habits of the fish ; to ascertain the food best suited to it, and its modes of feeding ; to observe the circulation of the blood, &c. ; and to encourage attention to our native fresh-water fish, by introducing them as ornaments into our rooms, instead of sending many thousand miles for gold and silver fish. In order that the reader may see how far these objects are carried out, we quote the paper itself :—

A Letter from MR. WM. ARDERON, F.R.S. to MR. BAKER, F.R.S., on keeping of small Fish in Glass Jars.

(Read Jan. 16, 1745-6.)

‘In the beginning of September 1744, I procured a small *Dace*, about an inch in length, which I put into a glass jar, that held near a quart. I kept it till the latter end of *May* following; in which time it grew full half an inch in length, but very little in breadth.

‘I began my observations with this kind of fish, because I took it to be the most difficult (having formerly made some few attempts this way); supposing, if I but tolerably succeeded in this, my other attempts might be more fortunate.

‘All this while it seldom or never eat any thing, excepting the small *animalcula* which happened to be in the water I gave it; which I found necessary to do once every day in winter, and twice or thrice in the spring, as the weather grew warmer.

‘When the water was fresh, it would come up to the top about once in an hour, to blow out some small bubbles of air; then, putting its nose near the surface, it would take in a fresh supply; and when it had taken a sufficient quantity, it would retire to the bottom again.

‘But, as the water became more and more adulterated by its use, its returns to the surface were more frequent, till, at last, it would remain there continually, till I gave it a fresh quantity.

‘Thus, I believe, I might have kept this fish for years; but a multitude of business one day prevented me from giving it clean water in due time; which, unfortunately, put a period to the life of my little companion.

‘However, such care I had taken before of this beautiful little animal, that, to the moment it died, it had not so much as lost one single scale.

‘At first when I catch’d this silver-coloured fish, it would not suffer me to come nigh the glass which included it, without the utmost confusion and surprize; but at last, by gentle usage, and a little art, it grew so tame, that if I came but in sight, it would be sure to be

on the same side of the glass I was on, and there lie gazing at me until I was weary of observing of it.

‘I very often took the opportunity of looking upon this fish by candle-light, which I always thought it took great pleasure in.

‘In the before-mentioned month of *September*, 1744, I likewise put a *Ruff*, about three inches in length, into another glass, which held about three quarts. This fish at first appeared mighty reserved, and would not eat anything, or suffer me to come nigh it, for several days; but, in a very short time, all-powerful hunger assisted me to make it so tame, as is scarce believable.

‘Though my dace found, amongst the minute *animalcula*, the little inhabitants of our river-water, enough to subsist upon, this ruff found nothing by which it could satisfy the calls of nature; so, of consequence, was compelled to take what I provided for it, and in what particular manner I was pleased to give it.

‘After this method did I bring it to be so tame, that it would not only eat small worms I threw into the glass for it, but would also take them out of my hands, or of a quill, just as I thought proper to give it them: nay, it would even rise out above the water for its prey; which is quite contrary to the way this kind of fish takes its food. And, at last, it would come to my hand whenever I put it into the glass, and suffer me to handle it.

‘But, to ease me of my care, when I had made all the observations I thought necessary, and in pity to its confinement, when I had kept it about seven or eight months, I gave it its liberty.

‘Out of the various sorts of fish I have made trial of, I never could bring any to be so tame as this above-mentioned: from which I infer, that fish of prey, as pikes, perch, ruffs, &c. are the properest objects for this kind of amusement; and did but our *English virtuosi* know how easily these sort of fish are tamed, and kept in glasses, it might be a means to lessen their esteem for those brought from *China*; unless it chiefly rise from their coming four or five thousand miles off.

‘Of all the kinds of fish I have viewed the circulation of the blood in, there’s none shew it in a finer manner than ruffs, whose fins are extremely transparent: besides, it’s a fish that’s vastly tenacious of life, and will live twenty or thirty minutes out of water, and not receive much damage.’

Sir John Hill’s book, at the time of its publication, made considerable stir; it has, however, long ceased to be regarded except as a sort of literary curiosity. For these reasons we quote the whole of Sir John’s notice of Mr. Arderon’s paper. The society long since attained a height which placed it far beyond the reach of such ridicule; consequently, the book is now forgotten, and never likely to be revived, except in connexion with the history of the society.

‘Incontestible proofs of a strange and surprising fact, namely, that Fish will live in water.’

‘The Royal Society has ever been fond of producing proofs of things that nobody ever doubted; as to such as the world has wanted certainty in, they have very prudently chose to be silent. They are a prudent body, and as they do not love disputes, in which it is possible they may be proved to be in the wrong, they chuse to advance nothing till they are very sure all the world will agree with them in it. Of this nature is the problem before us. The often commemorated, but never-to-be-enough-commemorated, Mr. Arderon, of Norwich, in the year 1744, took it upon him to prove that *fish will live in water*. He communicated his plan to Mr. Baker, whose approbation encouraged him to go on in his enquiries, till he was able, in the four hundred and seventy-eighth number of the *Philosophical Transactions*, to assert the fact boldly, and to prove it upon experiment, and to demand the thanks of the society for it.

‘We find by the date of his first experiment, and by that of the paper which contains the whole, that this amazing discovery was begun and compleated in the space of seventeen months. Conscious of the strict adherence of the body to their motto *nullius in Verba*,

he did not presume to expect their believing so strange a fact on his barely declaring it. He assures them that he tried the experiment first on a dace, and afterwards on a ruffe, and on both with success. He informs them that he kept these severally and at distances of time in glass jars; and, not to depart from the example of his friend and patron, who carefully delivers the depth and diameter of the pill-box he kept a beetle in, while he forgets to give us any account of its nature and structure, he tells us that the jar in which he kept his dace held near a quart, and that in which he kept the ruff was of near three times that capacity. Whether they were deep or shallow, whether they were of green glass or of white, or whether they had feet, or stood upon their base, we are left entirely in the dark.

‘He assures us, however, that he kept his dace alive in water from *September* till *May*; and that he verily believes he might have kept it much longer, had it not been, that, over-hurried one day with business, he forgot to change its water. He assures us, however, that he had taken so much care of this beautiful, gentle, silver-coloured animal (such are his epithets), that in the whole time he kept it, it never lost a single scale. He acknowledges also that it was somewhat shy at first, but he tells us, that gentle usage, and a little art, soon made it tame. It is somewhat unlucky, that he has not condescended to tell us what this art was, any more than what sort of care it was that he preserved its scales by. We are afraid this gentleman, who used to be more open and communicative at first, is now learning of Mr. *Baker* to be a little more choice of his secrets.

‘In fine, the whole relation consists in this; that the creature lived eight months in water, and then died by his neglect.

‘As to the Ruff, which was the object of his second trial, he tells us, indeed, that it was *mighty reserved* at first, and would neither eat nor suffer him to come near it, but that at length it became more tame than the other. This fish, Mr. *Arderon* assures the society, he kept seven or eight months, in all which time, whatever

happened to it before or after, he can aver that it really and truly lived in water.

‘The reader will think we banter him in giving such an account as this of a paper in the *Philosophical Transactions*; but in very sincerity there is no more in it; nor does there appear any the least hint that the author ever thought of proving anything else by it, than the very fact we mention in the title, namely, that dace and ruffs will live in water; from whence he seems to infer, that all other fish also will.

‘He concludes with a very strong and pathetic address to the *English* virtuosi to repeat this experiment, and to find by their own experience, how certain a fact it is that he advances; and he takes it for granted, that if this can ever be brought into practice, it will lessen their esteem for those fish brought from China, which esteem, he suspects, chiefly to arise from their coming four or five thousand miles.

‘It may not be improper to answer, in behalf of the *English* virtuosi, of the number of whom we take pride in declaring we have the honour to be, that we do not keep these fish of China in water, in our houses, either by way of proof that they will live in that element, or because they come so many miles, but because they are (as he says of that little writer *Woodward's Hypothesis*) very pretty.

‘The *Royal Society* were extremely satisfied with these curious and entertaining accounts, and returned their formal thanks for them; but the people out of doors grumbled something about nonsense and impertinence, when they read them, and foreswore buying any more of their works.

‘It was about this time, that the false and malicious report was set on foot, that the *Philosophical Transactions* were written by an exciseman of *Norwich*. How truly this denotation of employ may belong to the celebrated Mr. *Arderon*, his friend Mr. *Baker* is best able to tell: but the malice and falsity of the assertion is evident, from looking over the contents of this very number of those works, in which there are five papers communi-

cated by Mr. *Baker*, and only two of them are written by Mr. *Arderon*.'

The above extract is a fair specimen of the whole work, and we think it will be generally agreed, that to fill a quarto volume with such puerile matter, argues, on the part of its author, a large share of those very qualities of mind which he so much condemns in others.

In 1752, Lord *Macclesfield* became president, and from that time a marked improvement is observable in the value of the *Transactions*. Many excellent papers appeared during the presidentship of the Earl of *Morton*. The unfortunate dispute between Mr. *Wilson* and other electricians of the Royal Society, about the respective merits of pointed or knobbed conductors, occupies too great a proportion of the *Transactions* during the presidentship of Sir John *Pringle*; yet the volumes of that period contain many memorable papers, among which Dr. *Thomson* enumerates Dr. *Maskelyne*'s experiments at *Schhallien* to determine the density of the earth, with Dr. *Hutton*'s deductions from them; the experiments of Sir George *Shuckburgh*, *Evelyn*, and of General *Roy*, in order to establish correct formulas for measuring heights by the barometer; the report of the committee appointed by the Royal Society to determine the proper method of graduating thermometers, the experiments of Mr. *Hutchins*, to ascertain the freezing point of mercury,—and many others. During the presidentship of Sir Joseph *Banks* the *Transactions* participated largely in that success which marked the progress of science.

The dispute between Mr. *Wilson* and other electricians of the Royal Society alluded to above, appears at this distance of time, and under the present advanced state of electrical science, so singular and even ridiculous, that we cannot but express astonishment at the amount of discussion and even animosity which it excited. Since the resignation of Sir John *Pringle*, and the consequent election of Sir Joseph *Banks*, are said to have been due to this dispute, a brief account of it will not be out of place here.

In the year 1773 an application was made, on the part of government, to the Royal Society, for information as to the best form of lightning-conductors for the protection of the gunpowder-magazine belonging to the board of ordnance at Purfleet. The society replied by quoting the advertisement which had been affixed to their published Transactions every year, from the year 1762: 'That it is an established rule of the society, to which they will always adhere, never to give their opinion as a body on any subject, either of nature or art, that comes before them.' The society were then requested to appoint a committee for the purpose. After much discussion this was agreed to; and a committee consisting of Mr. Cavendish, Dr. Watson, Dr. Franklin, Mr. Robertson and Mr. Wilson, was appointed. After examining the building, the four gentleman first named recommended pointed conductors. Mr. Wilson dissented from their judgment, recommended the blunt form of conductor, and supported this opinion, if not with strong arguments, at least with many words. The soundness of this opinion was at once refuted by Nairne, Henley, Swift, and other electricians. Pointed conductors were accordingly erected. Now it happened, unfortunately, that in the year 1777 the Purfleet magazine received some slight damage from lightning, a circumstance which seemed to furnish a complete triumph to Mr. Wilson; but the fact was, that although at that time the method of erecting and distributing lightning-conductors was not thoroughly known, yet the conductors were so far efficacious, that the powder was not fired, and the damage done to the building was but trifling. However, the government thought fit again to apply to the Royal Society, in answer to which application a committee consisting of the most distinguished electricians was appointed, whose deliberate judgment was a second time in favour of pointed conductors, and a second time was their judgment opposed by Mr. Wilson. 'The thing was so clear, that in any other country or at any other time, this man would have been laughed at, and the conductor would have been

made according to acknowledged principles ; but at this time England was at the height of her quarrel with her American colonies, and it was Franklin who had invented pointed conductors. Hence a question of natural philosophy was made a question of party politics. It was not scientific men who were now allowed to decide the matter, but political partizans, so that soon the advocacy of pointed conductors became identified with the insurgent colonists, and those who did not advocate the blunt points were evidently disaffected subjects. As usual in such cases, the populace, and even the upper ranks of society, took up the quarrel, without inquiring into its merits, or indeed knowing anything about it. Wilson thus found protection and support, as he would have done against the theorem of Pythagoras, if geometry had been the subject of party dispute. It is even declared that an august personage, who on all other occasions had proved himself to be a liberal and enlightened patron of science, had the misfortune to allow himself to be prejudiced against pointed conductors. He even requested the president, Sir John Pringle, a man of judicious mind and elevated character, to employ his official influence in supporting Mr. Wilson. The president replied respectfully, that duty as well as inclination would always induce him to execute his Majesty's wishes to the utmost of his power ; 'but, sire,' said he, 'I cannot reverse the laws and operations of nature.' He might have added, says Cuvier, that if it is honourable in princes to protect science, (which is indeed only their duty,) to amuse their leisure with scientific pursuits, and to inform themselves as to the merits of questions which these pursuits occasion, it is perhaps only on condition that they do not give the influence of their rank to the support of such opinions as they may adopt. But these reflections did not occur to the royal mind, nor were the representations of Sir John Pringle received with his Majesty's usual consideration ; and as this quarrel, which had now existed three years, had produced much strife and vexation, the president thought it necessary to his peace of mind to resign.

Such is the usual version of Sir John Pringle's share in this celebrated quarrel. We find, however, that Dr. Kippis, in his life of Sir John Pringle, discredits the assigned cause of his resignation of the presidency. At the time of that event, Dr. Kippis was 'in the habit of a strict intimacy with Sir John, and he never heard from him any suggestion of the kind that has been mentioned. Perhaps Sir John Pringle's declining years, and the general state of his health, will form sufficient reasons for his resignation. In another passage he says:—

'It was at a late period of life, when Sir John Pringle was in the sixty-sixth year of his age, that he was chosen to be President of the Royal Society. Considering, therefore, the extreme attention that was paid by him to the various and important duties of his office, and the great pains he took in the preparation of his discourses, it was natural to expect that the burthen of his honourable station should grow heavy upon him in a course of time. The burthen was increased, not only by the weight of years, but by the accident of a fall in the area of the back part of his house, from which he received considerable hurt, and which, in its consequences, affected his health and weakened his spirits.'

The society has, at various times, according to its means, bestowed pecuniary and honorary rewards on persons distinguished by their discoveries in pure or mixed science. In the year 1668, the president, Lord Brouncker, proposed that a silver medal worth about twenty shillings should be given to any fellow, not a curator, who should make before the society any particularly meritorious experiment.

Dame Lady Sadleir, the relict of Dr. Croone, one of the earliest members, left by her will, in 1706, a sum of money for the purpose of founding a lecture 'for the advancement of natural knowledge,' to be delivered to the Royal Society. This lecture was given for the first time by Dr. Stuart, in 1738.

The Bakerian lecture, on electro-chemistry, was founded in 1774, and the first lecture was delivered in the following year, by Mr. Peter Woulfe.

Sir Godfrey Copley, one of the members of the society, at the time of his death, in 1709, bequeathed one hundred pounds, the interest of which, or five pounds, was to be given at each anniversary meeting of the society, by the determination of the president and council, to the person who had written the best paper on experimental philosophy during the preceding year. In process of time this pecuniary reward, which could not be an important consideration to a man of enlarged and philosophical mind, was changed into the more liberal form of a gold medal; in which form it is now become a truly honourable mark of distinction, and a just and laudable object of ambition. It is awarded to foreigners or Englishmen, in order to encourage an honourable competition among philosophers.

Sir Benjamin Thompson, afterwards Count Rumford, on the 12th July, 1796, transferred to the Royal Society (of which he was vice-president, and to whose Transactions he was a distinguished contributor during twenty-five years) the sum of one thousand pounds, three per cent. consols, with a view that the interest be applied every two years as a premium to the author of the most important discovery or useful improvement which shall be made known to the public in any part of Europe during the preceding two years on the subject of heat or light; the preference to be always given to such discovery as shall, in the opinion of the president and council, tend most to the benefit of mankind. This prize is also given in the form of a medal of gold, and one of silver, both of which are struck in the same die. The first person who received the prize was Count Rumford himself, in the year 1800, and the second was Professor Leslie, in 1804. When no opportunity has been given for awarding the prize, the interest has always been added to the principal sum.

In the year 1825, his Majesty George IV., for the purpose of further promoting the objects and progress of science, made to the society an annual grant of one hundred guineas for the purpose of establishing two prize medals, to be presented to the persons who during

the year shall make the most important discovery in science or art. These medals were in 1826 awarded to Mr. John Dalton and Mr. James Ivory—to the former for his development of the chemical theory of definite proportions, commonly called the atomic theory, and for various other labours in chemical and physical science—to the latter, for his papers on the laws which regulate the forms of planets, on astronomical refractions, and for other mathematical illustrations of important points in astronomy. The annual grant of these medals is continued by Her present Majesty.

Sir John Pringle was the first president who introduced the practice of pronouncing a discourse on the annual assignment of a medal. 'It was, no doubt,' says Dr. Kippis, 'always usual with the president, on the delivery of the medal, to pay some compliment to the gentleman on whom it was bestowed, but the custom of making a set speech on the occasion, and of entering into the history of that part of philosophy to which the experiments related, was first introduced by Mr. Martin Folkes. The discourses, however, which he and his successors delivered were very short, and were only inserted in the minute-books of the society. None of them had ever been printed before Sir John Pringle was raised to the chair. The first speech that was made by him being much more elaborate and extended than usual, the publication of it was desired; and with this request it is said that he was the more ready to comply as an absurd account of what he had delivered had appeared in a newspaper.'

The subject of this first discourse related to the discoveries of Dr. Priestley 'on different kinds of air,' in acknowledgment for which the gold medal was awarded. It does not, however, seem to have been the intention of the society to adopt the practice of printing the president's discourses, but the discourses of Sir John Pringle were so admirable, that their publication was requested every year during the six years of his presidency. In reference to these discourses, Dr. Kippis says, 'If he had continued to preside in the chair of the Royal So-

ciety, he would, no doubt, have found other occasions of displaying his acquaintance with the history of philosophy. But the opportunities which he had of signalling himself in this respect were important in themselves, happily varied, and sufficient to gain him a solid and lasting reputation. Perhaps it would not be desirable that publications of such a nature should be very numerous, since by that means they might lose by degrees their novelty, their utility, and their acceptance. We do not therefore think that in this particular view Sir John Pringle ought to be considered as a model to his successors. It is best that each president should distinguish himself in that way which is peculiarly suited to his own pursuits and studies ; for thus, every valuable object being regarded in its turn, the honour of the society, and the interests of philosophical and natural knowledge, will most essentially be promoted.'

CHAPTER III.

BIOGRAPHICAL NOTICE OF SIR JOSEPH BANKS.

Tribute to the Memory of Sir Joseph Banks by Baron Cuvier—
Notice of the Family of Banks—Birth and Parentage of Banks—
His Education—Anecdotes—His early Taste for Botany—State
of Natural History at this time—Banks becomes acquainted with
the Earl of Sandwich—Botanical Rambles—Anecdote—Is ad-
mitted into the Royal Society—His Voyage to Newfoundland—
Cuvier's Notice of the Character of George III.—Projected Voy-
age of Discovery under Captain Cook—Banks proposes to join
the Expedition—Dr. Solander—Cuvier's Notice of the Expe-
dition—Return of the Expedition—The Collections of Banks—
Service rendered to Science by this Expedition—Proposals for a
Second Expedition—Banks prepares to join it—His Plans im-
peded—He relinquishes the Idea of joining the Expedition, but
assists its Objects—Determines on a Voyage to Iceland—His
Companions—Discovers the Columnar Stratification of Staffa—
Arrival in Iceland—Benefits conferred on the Icelanders—Set-
tles in London—Is elected President of the Royal Society—
His Marriage—Discontents in the Royal Society—Complaints
against the New President—Their Origin—Meetings of the So-
ciety to consider these complaints—The Conduct of the Presi-
dent approved—Cuvier's Notice of the Progress of the Society
during the Presidency of Banks—Honours bestowed on Him—
Friendship of George III.—Generous Behaviour of Sir Joseph
Banks towards scientific men—Behaviour of Banks to Caley—
Personal Appearance of Banks—His Death—Notice of his Li-
brary bequeathed to the British Museum—Catalogue thereof—
Offices held by Banks—List of his Publications—Abstract of
his Will.

THE highest tribute that can be paid to the me-
mory of a distinguished man is not, perhaps, that which
is rendered by his own countrymen, for they may be
stimulated by national feeling or influenced by personal
affection. But when the illustrious worthies of a fo-
reign land, which, for ages, has been our powerful rival

in arms, in science, and the arts, hold a meeting for the express purpose of recording the excellencies of his genius and the virtues of his character, and that in a manner as unqualified as it is eloquent—this is assuredly the highest tribute that can be paid to his memory.

At a meeting of the Royal Academy of Sciences at Paris, held on the 2nd April, 1821, Baron Cuvier pronounced a eulogium on Sir Joseph Banks (who had enjoyed the distinguished honour of being one of the very few honorary members of that body), which he commenced in the following terms:—

‘The works which this man leaves behind him occupy a few pages only: their importance is not greatly superior to their extent; and yet his name will shine out with lustre in the history of the sciences. In his youth resigning the pleasures which an independent fortune had placed at his command, he devoted himself to science, and in her cause he braved the dangers of the sea and the rigours of the most opposite climates. During a long series of years he has done good service to the cause of science by exerting in its favour all the influence arising from his fortunate position, and his friendship with men in power; but his especial claim to our homage rests on the fact that he always considered the labourers in the field of science as having a rightful claim on his interest and protection. During the long period of two and twenty years in which war extended its ravages to almost every part of the two worlds, the name of Banks was in all places a palladium to such of our countrymen as devoted themselves to useful researches. If their collections were seized, they had only to address themselves to him to ensure their restoration; if their persons were detained, the time occupied in acquainting him with the fact was the only delay which was interposed between them and liberty. When the seas were closed in upon us on all sides, his voice opened a passage to our scientific expeditions. Geography and natural history are indebted to his solicitude for the

preservation of their most valuable labours:—but for him our public collections might be now, and perhaps for ever, deprived of a portion of the riches which now adorn them. We may without hesitation admit that such services as these are of as much value as many books; and if in this discourse our chief expressions will be those of gratitude due to the performance of honourable actions, it is not expecting too much of our auditors to hope that this sentiment will be participated in as lively a manner as if we had to mingle it with admiration at the record of grand discoveries.’

The subject of the present notice was born in Argyle-street, London, in the year 1743. According to the pedigree entered at the Herald’s College, the family of Banks originated in one Simon Banke, a Swede, who, in the seventh year of the reign of Edward III. established himself in Yorkshire, and married the daughter and heiress of——Caterton, of Newton, in that county. By this marriage, the manor of Newton, in the wapentake of Staincliffe, came to the family of Banke, with whom it remained until it was sold in the middle of the seventeenth century. From this Simon Banke, Sir Joseph was the eighteenth in lineal descent. The family then seems to have settled in Lincolnshire, where the grandfather of Sir Joseph is said to have practised medicine with such success, that he acquired a large fortune; he became sheriff for the county in 1736, and sat in one or two parliaments as representative of the town of Peterborough. He married Anne, the daughter and heir of William Hodgkinson, Esq. of Overton, in the county of Derby, by whose will, William, the eldest surviving son, the father of Sir Joseph Banks, took the name and arms of Hodgkinson, but resigned them to his younger brother on succeeding by inheritance to the estate of Revesby Abbey. This, together with the Overton estate, descended to Sir Joseph. The date of the birth of Sir Joseph is incorrectly stated by many authorities. In the parish-register of St. James, West-

minster, the baptism and date of birth are thus entered: 'Feb. 26, 1743, Joseph Banks, son of William Esq. and Sarah, born on Jan. 4th.'

The education of young Banks was such as is usually given to English youths in good circumstances. He was first consigned to the care of a private tutor; at the age of nine years he was sent to Harrow-school, where he remained four years; he was then sent to Eton. He is described in a letter from his tutor about this time as being well-disposed and good-tempered, but so immoderately fond of play, that his attention could not be fixed to study. At the age of fourteen his tutor first had the satisfaction of seeing him read of his own accord during his leisure hours. This sudden turn he afterwards explained to Sir Everard Home. One fine summer-evening he had bathed in the river as usual with other boys, but having remained a long time in the water, he found, when he came to dress himself, that all his companions were gone: walking leisurely along a lane, the sides of which were richly enamelled with flowers, he stopped, and looking round, involuntarily exclaimed, 'How beautiful!' After some reflection he said to himself, 'It is surely more natural that I should be taught to know all these productions of nature in preference to Greek and Latin: but the latter is my father's command, and it is my duty to obey him: I will however make myself acquainted with all these different plants for my own pleasure and gratification. He began immediately to teach himself botany; and, for want of more able tutors, submitted to be instructed by the women employed in culling simples to supply the druggists' and apothecaries' shops, paying sixpence for every material piece of information. While at home for the ensuing holidays, he found in his mother's dressing-room, to his inexpressible delight, a book, in which all the plants he had met with were not only described, but represented by engravings. This, which proved to be an imperfect copy of Gerard's *Herbal*, he carried with him to school.

He quitted Eton in his eighteenth year, and was entered a gentleman-commoner at Christ-church College, Oxford, in December 1760. Here his love of botany was confirmed, and he entered with ardour upon other departments of natural history. His zeal for the acquirement of botanical knowledge was so great, that finding no lectures were given on that science, he applied to Dr. Sibthorpe, the botanical professor, for permission to procure a qualified lecturer, the remuneration of whom was to fall entirely upon the students who composed his class. This arrangement was acceded to, and a sufficient number of students having set down their names, he went to Cambridge, and brought back with him Mr. Israel Lyons, a botanist and astronomer. Banks soon made himself known in the university by his superior knowledge in natural history. He once told me in conversation, says Sir Everard Home, that when he first went to Oxford, if he happened to come into any party of students in which they were discussing questions respecting Greek authors, some of them would call out, 'Here is Banks, but he knows nothing of Greek.' To this rebuke he made no reply, but said to himself, I will very soon excel you all in another kind of knowledge, in my mind, of infinitely greater importance; and not long after, when any of them wanted to clear up a point of natural history, they said, 'We must go to Banks.'

Having taken a honorary degree, he quitted Oxford in December 1763. His father had died in the year 1761, so that having become of age within a month after quitting the university, he became the uncontrolled possessor of a large fortune, and master of his own actions. To most young men this premature liberty would have proved dangerous, if not fatal; but Banks had, fortunately for himself and for science, imbibed far higher tastes than usually belong to young Englishmen of fortune. His attachment to natural history was enthusiastic, and now that he was master of his own actions, he began to pursue the study

with greater zeal than before. To go the narrow round of the common fashionable tour could only appear as miserable trifling to a young man whose mind glowed with a love of scientific enterprize, and of the knowledge of nature. But to explore unknown scenes, and to contemplate the beauty and majesty of nature where they had not yet been violated, was a scheme worthy to be conceived and pursued by a man of virtue and genius.

At this period natural history was neither understood nor appreciated. The science had only just received two of her sublimest interpreters, Buffon and Linnæus. Buffon, by charming and eloquent descriptions, his bold and fascinating style;—Linnæus, by his severe accuracy and ingenious classifications, made natural history both attractive and philosophic, and won for it the regards of men of literature as well as of science. But it was soon perceived that the foundations only were laid, that millions of organic beings were concealed in foreign lands; and that for the progress of science numerous collectors and observers were necessary. Knowledge, leisure, and abundant means, are the qualifications of collectors, and it was difficult to imagine how they were to be procured; for it generally happens that scientific naturalists are not rich men, and rich men are not naturalists. Banks however was one of the few exceptions to this remark, and he was destined to awaken a new spirit in favour of natural history. His studies and researches, begun at school, were now carried on on his own estate at Revesby. This was situated on the extremity of that vast extent of marshy meadows which surround Boston Bay, the nature of which is so much like Holland, that one part of it bears the same name. He passed a portion of each year in this place, draining, and embanking, and carrying on such plans of improvement as were best suited to the nature of the property; he stocked the lakes and ponds with fish, and often amused himself with angling. It is said, that during one of his angling excursions he became acquainted with the Earl of Sandwich, afterwards one of the lords of the admiralty, whose name since became

so honourably distinguished in connexion with the geographical discoveries made during his administration. If this anecdote be true, remarks Cuvier, it affords another example of the great effects that may arise from slight causes ; for it cannot be doubted that the influence of Banks contributed to that splendid series of geographical discoveries. The presence of Banks might not have been necessary to urge Lord Sandwich to promote those expeditions to which the taste and inclination of his royal master sufficiently urged him ; yet it is certain that Banks more than once indicated the points most worthy of attention in these expeditions, and acquainted him with the surest means for rendering them profitable.

But we are getting in advance of the course of our narrative. Banks devoted his leisure to the study of nature, and of the works of the two illustrious naturalists of Europe. He now began to form that library which afterwards became so celebrated. He herbalized much, and on foot ; and being more zealous in procuring specimens than mindful of his personal appearance, he was often mistaken for a vagabond, and, more than once, for a thief. One day being overcome by fatigue, he retired to some distance from the high road, and was soon asleep. In this condition, being discovered by some police-officers, he was apprehended as a vagrant, and taken before a magistrate : after a few explanations he was of course liberated, greatly to the amusement of all parties.

In the year 1766 he was admitted into the Royal Society. In the summer of the same year, one of his friends, Mr. Phipps, being lieutenant in a vessel destined to protect the fishery of Newfoundland, Banks obtained permission to accompany him, for the purpose of making researches in natural history on the coasts of Newfoundland and Labrador. Here he laid the foundation of his great collection, and his ardour for scientific discovery was confirmed. He returned to England the following year by way of Lisbon.

On his return a far more splendid opportunity offered itself of indulging his prevailing taste. After the general

peace of 1763, nations seemed desirous, by promoting peaceful enterprizes, to repair the evils which their dissensions had produced. 'England victorious in both hemispheres' says Cuvier 'saw a boundless career of glory open to her on all sides, which, under the guidance of an ambitious chief, might have produced deplorable results to the cause of humanity. But, happily, at this particular epoch, her sceptre, which ruled the waves of nearly the whole ocean, was in the hands of a young monarch whose manners were pure, his tastes simple, and who had been early impressed with the great truth that a useful discovery may be as honourable to a monarch's reign as a great conquest. He was the first among princes whose design it was to take possession of new lands without diffusing terror in them, and to cause his power to be known only through the medium of his bounties. Whenever the historian meets with such an example as this, it is his duty to display it in all its beauty; and it belongs especially to the historian of science to fulfil this duty; to elevate himself above the miserable rivalries of nations; and however often and however long the period that he who has deserved this homage has been engaged in war with France, it is, doubtless, not to such an assembly as I now address that I need apologise for having rendered that praise which is so justly due.'

From the time of his accession to the throne, George III. had been desirous of sending out vessels to the south seas, for the purpose of extending geographical science. Byron had already been despatched thither in 1764; Wallace and Carteret, in 1766, were placed at the head of successive voyages of discovery. The position and general character of the island of Otaheite having been ascertained by Captain Wallace, this spot was selected by English astronomers as being well adapted for observing the transit of the planet Venus over the disc of the sun.

Intimation to this effect having been made by the Royal Society to his Majesty's government, and favourably received, it was resolved in 1768 to fit out a fourth expedition under the command of Captain Cook.

While preparations were being made for this expedition, in which the Royal Society took a deep interest, Banks, who had become a member thereof, requested, and obtained permission to be allowed to share the dangers and the glory of the voyage. The original intention of this voyage was to promote geographical and astronomical science, but Banks determined that it should also subserve the interests of natural history. At his own cost he provided every kind of apparatus that was likely to conduce to that object. He engaged Dr. Solander to accompany him on the voyage. This gentleman was a Swede by birth; he had been a distinguished pupil of Linnæus, and was then occupying the office of sub-librarian at the British Museum; his scientific merits alone having been his chief recommendation to patronage in England. Mr. Banks also engaged two artists, one to delineate views and figures, and the other to paint subjects of natural history. A secretary, and four servants, two of whom were negroes, formed the remainder of his suite. He laid in a supply of fruit, seeds, and other articles that might be serviceable to the tribes they might visit.

‘This voyage,’ says Cuvier, ‘deserves to be noted as forming an epoch in the history of science. Natural history having thus contracted an alliance with astronomy and navigation, now began to extend its researches over a wider sphere. For the similar purpose of observing the transit of Venus, the Empress Catherine II. had given order for expeditions into Siberia, under the direction of Pallas, which were attended by several naturalists, who made rich collections. At the same time, Bourgainville, by order of Louis XV., circumnavigated the globe, taking with him Commerson, a man of indefatigable activity and almost universal knowledge; and it is indeed by these three nearly contemporaneous enterprizes that governments have learned how nearly related to each other are all the sciences, and how much their value is increased by combining their labours.’

On the 26th August, 1768, Mr. Banks sailed with the expedition from Plymouth Sound. The personal

adventures of Mr. Banks do not properly belong to the subject of the present work; but we may here quote the remarks of M. Cuvier, when, prompted by a generous enthusiasm at the mention of the voyages of Captain Cook, he exclaims:—

‘The voyages of Captain Cook! Who does not remember the delight with which they were read in youthful years! Who has not trembled for our navigators when the cold threatened them with the sleep of death amid the snows of Terra del Fuego? Who has not sighed to live as they did with the sons and daughters of Otaheite, with those gentle, beautiful, and happy beings; who enjoyed with child-like simplicity the delights of a sky never clouded—of a land fruitful without tillage? Whose heart has not palpitated with fear when, entangled among the coral rocks of the coast of New Holland, they saw, by the light of the moon, the sheathing boards separate from their vessel and float around them; then the false keel, while the water was rushing in with such rapidity that their pumps, worked incessantly, could barely keep the ship afloat; and when, during two days with death before them, they are suddenly saved by the suggestion of a man, who was not a sailor, to *fother* the vessel? Everything, in short, in these voyages, whether we notice their dangers or their pleasures—the varied manners of the people whom our navigators visit—the friendship of the Otaheitans, and the fierceness of the cannibals of New Zealand—the general conflagration of the grass, with which the natives of New South Wales threatened to envelope our travellers—everything seems to realize the romantic wonders of the Odyssey, which have charmed so many nations during so many ages.

‘No pains were spared by our naturalists to enrich their collection, or to gratify their curiosity. Banks displayed an astonishing activity; fatigue does not depress him, nor danger deter him. We see him in Brazil sneaking ashore like a smuggler, in order to seize upon some specimens of the natural productions of that rich country, in spite of the stupid jealousy of the governor. At Otaheite he allowed himself to be painted black from

head to foot, in order that he might join in a funeral ceremony which he would not otherwise have been allowed to witness; and it was not simply by *seeing*, but by *observing*, that he displays his true character. He is always in advance; he is referred to in time of difficulty; it was he who pursued the robbers and recovered the stolen goods; and, if he had not thus recovered the quadrant, which had been adroitly carried off by an islander, the principal object of the enterprize—the observation of the passage of Venus over the sun's disc—would have failed.'

After an absence of nearly three years, the *Endeavour* arrived home in June 1771. George III. and the people of Britain received the voyagers with acclamation, and the king shewed how warmly he approved of Banks by repeated testimonies of his regard. Banks and Solander, accompanied by Sir John Pringle, were invited to Richmond, where they had the honour of a private royal interview, which lasted some hours.

It was long hoped that Banks and Solander would give an account of their labours and of the immense collections made during the expedition. Solander died in 1782, and he had ten years to dispose of his part of the undertaking. In addition to their common journal, their notes, all the designs made under their direction, still exist in Mr. Banks' library now in the British Museum. A series of engravings had been commenced, which it was intended to extend to two thousand; but from some cause not very well explained, nothing was ever published under the auspices of the authors. But these valuable collections were not lost to the world. One of the most remarkable features of the character of Banks was the generosity with which he communicated his scientific treasures to all who appeared to him to be capable of appreciating them. Fabricius described all his insects. He gave specimens of all his fishes to Broussonet for the Ichthyology which he had commenced. Botanists who wished to see his plants were free to consult his botanical indexes. Robert Brown's work on the plants of New Holland was composed in

the midst of Banks' collections, and many other naturalists owe similar favours to Banks. We are also indebted to him for the introduction of numerous plants and animals into Europe. In all the gardens of Europe he scattered the seeds of the islands of the south sea, as in those islands he had scattered the seeds of Europe. He transplanted into Europe many of the beautiful varieties of arbutus which now adorn our parks and plantations. He transplanted into the West Indies the valuable sugar-cane of Otaheite and the bread-fruit tree, thus rendering as great a benefit to America as we received from her when she gave us the potato. He brought into notice the flax of New Zealand, the threads of which are more tenacious than those of any other plant cultivated in Europe. He made us first acquainted with those singular animals the kangaroo, the phascosomes, and many others. But all these are of little importance compared with the extensive knowledge of the Pacific to which this voyage opened the way; the crowds of islands with which it is dotted over, and the remarkable races which inhabit them.

Although by this voyage the long-cherished opinion that New Zealand and New Holland formed part of a vast southern continent was disproved, yet the question as to the existence of such a continent remained undecided. It was therefore resolved to fit out a second expedition to settle this point. The Earl of Sandwich entered with zeal into the design; it met with the cordial support of the king; Cook was again chosen to command the expedition; and Banks made zealous preparations for again accompanying him. His establishment was on the most extensive scale: it was to be accompanied by Zoffani the painter, under his Majesty's express patronage; three draughtsmen, two secretaries, and nine servants acquainted with the modes of preserving animals and plants. On this account orders were given by the admiralty for fitting out the ships with every possible accommodation that Mr. Banks could desire; but finding himself thwarted by the controller of the navy in most of his proposals respecting

the accommodations in the ships, he relinquished all intention of making the voyage. The circumstances of the case are sufficiently explained in the following statement given in the *Annual Register* for 1772, under the date of 11th June:—‘Mr. Banks and Dr. Solander were not consulted on the choice of the ship; and on their objecting to want of accommodation for their draughtsmen, &c. as well as to her want of room to stow the crew, the navy board undertook to give all those conveniences, and patched the same ship with a round house and square deck, and without considering whether she could bear it, manned and equipped her for the voyage. Mr. Banks, Dr. Solander, &c., examined her a second time; found her convenient if she could sail, of which they doubted, and reported her top-heavy. Their observations were disregarded; but a gale of wind arising, laid her on her side without her having a single sail unreefed, and she could not for some time recover; they ordered the long-boat to save the crew, when unexpectedly she recovered. Notwithstanding this accident, she was reported good, and fit for the voyage, and was ordered to Plymouth. The pilot obeyed these orders, sending word he could not ensure her out of the river. At last it was found the farce could not be carried on longer, and the reports on which the navy board proceeded were found false; expresses were sent along the coast to Deal, &c., to order her into the nearest dock to Sheerness, if they could overtake her: this was no difficult task; for while the other ships cleared the Downs, she did not make one knot an hour. She was put into dock; they cut off her round-house, and part of her deck, reduced the cabin, and put her in the same unfit position she was in when first objected to; and then the question was politely put to Mr. Banks, “Take this or none.” Mr. Banks has laid out several thousand pounds for instruments, &c. preparatory for the voyage; Mr. Zoffani (a well-known painter) near a thousand pounds for necessaries; and the other gentlemen very considerable sums on that account.’

Another account states that so anxious were the

admiralty to do everything possible for the accommodation of Mr. Banks and his suite, 'that the first lord, the Earl of Sandwich, and Sir Hugh Palliser, actually went down to Sheerness to superintend the alterations, and to preserve things in such a state as to accommodate the man who was nobly resigning all the delights of polished society in the cause of science. It was impracticable however with any regard to the safety of the ship, and the geographical objects of the expedition, to preserve the necessary accommodations, and Mr. Banks gave up his plans, though with great regret.'

It has been supposed that blame attaches to Cook for having encouraged, or at least not having removed the impediments thrown in the way of the naturalists; and it has been suggested that Cook regarded Banks as a powerful rival in the fame which accompanies the successful accomplishment of such enterprizes. It has been further surmised, that the morose and inflexible character of Cook rendered disagreeable the position of those who served with or under him. In a condensed account of Cook's voyages published in the *Edinburgh Cabinet Library*, the writer says in a note, p. 344, 'This charge appears destitute of the slightest foundation. During the first voyage, which extended to nearly three years, Sir Joseph could not fail to become intimately acquainted with the peculiarities of Cook's disposition; and knowing these so fully, it is quite inconsistent with the decision and whole character of the late president of the Royal Society, to suppose that he would have determined to join the expedition, and made expensive arrangements, only to forego his design when the hour of sailing was at hand. Indeed, it is well known, that he gave up his project only "because the navy board shewed no willingness to provide that accommodation which the extent of his preparations and the number of his scientific followers required."'

It is honourable to Banks that although he was thus compelled to abandon the voyage, he used his utmost exertions to promote its objects. Dr. James

Lind, a skilful physician, had been appointed naturalist with a parliamentary grant of four thousand pounds; but this gentleman declined the appointment as soon as Mr. Banks had refused to go. Banks therefore exerted his interest in favour of Dr. John Reinhold Forster and his son, who were engaged by the admiralty only ten days before the expedition was to sail. On the return of the Forsters, their drawings were purchased by Banks, and placed in his library.

Being thus disappointed of a second circumnavigation of the globe, Banks determined to undertake a voyage to Iceland. This object was partly scientific observation and partly to keep together and employ the draughtsmen and other persons whom he and Dr. Solander had engaged for the South Sea expedition. The vessel hired for this purpose was engaged at the rate of one hundred pounds per month. It was well fitted out for the purpose of naturalists, and on the 12th July, 1772, Mr. Banks set sail in company with Dr. Solander, Dr. de Troil, Dr. James Lind, and other friends: the whole number including draughtsmen, writers, seamen and servants, amounted to forty persons.

In the course of their voyage to Iceland our indefatigable naturalists were induced to tarry for a short time among the Hebrides, on the north west-coast of Scotland. Among other objects of interest, they discovered that wonderful natural phenomenon which had hitherto escaped attention—the columnar stratification of the rocks surrounding the caves of Staffa, an account of which was published during the same year from Mr. Banks' Journal, in Mr. Pennant's *Tour in Scotland*.

They arrived safely in Iceland, and devoted a month to the examination of the island. On the 12th September they stood on the summit of the famous volcanic mount Hecla, a spot which no other traveller had been known to have attained. The hot springs, the siliceous rocks, the animals and plants of the island, were carefully examined, and a rich collection of botanical and other specimens was made. Banks also purchased a large col-

lection of Icelandic books and manuscripts, which he afterwards presented to the British Museum.

Banks published no account of this voyage, but seemed to rest contented with the knowledge that no really valuable observations were lost. Dr. de Troil published a narrative of the voyage, and Banks gave his drawings of Staffa, as well as the description he had made, to Mr. Pennant for that gentleman's work on Scotland. But as in the case of the South Sea islanders, Banks did much to benefit the Icelanders; he invited the attention of the Danish court to their condition, and twice during times of scarcity he sent to Iceland cargoes of grain at his own cost. Cuvier says of him, that, like the deified personages of the ancient mythology, he became a sort of providence to the places he had once visited.

Banks now settled in London, and devoted his time and his ample fortune to the promotion of science. His house was opened with equal hospitality to the scientific men of other lands, as well as to those of his own country. His house became a sort of academy of science—a rallying point for men of science and genius of all countries; and Banks felt the greatest delight in seeing about him friends whom he had first brought together, enjoying his rich and well-arranged library and collections in natural history, which could not at that time be procured elsewhere.

In the year 1777, when Sir John Pringle retired from the presidency of the Royal Society, a general opinion was entertained that no one was better qualified to occupy the vacant chair than Mr. Banks. It was precisely the office to which such a man might justly aspire, and it has been remarked, that if the best judges had been required to single out a man in every respect most qualified to fill the office, and promote the best interests of the institution, they could not easily have passed over the claims of Mr. Banks. He was accordingly elected, and in November 1778 entered upon the duties of the office. He immediately devoted himself with the most successful zeal to the faithful dis-

charge of them. His attention had the happy effect of procuring communications in the highest degree interesting and important, and of gaining an accession of persons of rank and talent to the list of members, as well as exciting the whole body to extraordinary diligence and activity in the proper pursuits of the society.

In March 1779 Mr. Banks married Dorothea, eldest daughter of William Western Hugessen, Esq. of Provender, in the parish of Norton in Kent. In the year 1781 he was created a baronet. In the year 1782 he experienced a great loss by the death of his friend and fellow-labourer Dr. Solander. This event probably deterred him from publishing any of the results of his extensive researches.

During the first three or four years of the presidency of Sir Joseph Banks harmony prevailed in the Royal Society, and science reaped abundant advantage; but notwithstanding the zeal and assiduity of the president, and the general success of the institution, discontents began to arise; a variety of complaints, the result of misunderstanding and prejudice, were industriously circulated in regard to the conduct of the president; it was said that science was degraded by the election of a mere amateur to the chair which Newton had filled; as if it could be hoped or expected, says Cuvier, that another Newton would ever again occupy it; but then a mere naturalist was placed at the head of so many mathematicians; as if it were not just, says the same enlightened philosopher, that every science should in turn experience honour in proportion to the benefit it had conferred on mankind. But these general complaints were soon made to assume a more specific form. It was alleged against the president that he arrogated to himself the exclusive power of introducing new members to the society, and by this means filled it with ignorant and trifling men of wealth and rank; while the inventor in art, the discoverer in science, and the teacher of knowledge, were driven away with scorn. It was further charged against him, that his hostility to mathematical science threatened to bring it into discredit and neglect

in the society ; and it was observed with unjust sarcasm, that he possessed no scientific merits but such as depended merely on bodily labour and the expenditure of money.

Such were the numerous complaints made against the new president ; but, however respectable the persons from whom they emanated, and however deep and general the impression which they made, their injustice has been abundantly proved. A writer in *Tilloch's Philosophical Magazine* remarks :—‘ When Sir Joseph Banks was raised to the presidency, he found secretaries ambitious of assuming that power which alone belonged to his office, and that too great a facility was given to the admission of members : so much was this the case, that D’Alembert used jocosely to ask any of his acquaintance coming to England if they wished to become members of the society ? and intimating, that if they thought it an honour, he could easily obtain it for them. Sir Joseph Banks, therefore, with wise and zealous attention to the true interests of the society, resolved to use every just and honourable precaution to hinder the honours of its fellowship from being in future improperly bestowed. The first principle which he thought proper to adopt with a view to this end was, ‘ that all persons of fair moral character and decent manners, who had eminently distinguished themselves by discoveries or inventions of high importance, in any of those branches of art or science which it was the express object of this society to cultivate, ought, whatever their condition in life, to be gladly received among its members.’ But, in the next place, he was of opinion, ‘ that of those who were merely lovers of art or science, and had made no remarkably ingenious contributions to their improvement, none ought to be hastily received into the Royal Society whose rank and fortune were not such as to reflect on that society and its pursuits a degree of new splendour, as well as to endow them with the means of promoting its views on fit occasions by extraordinary expense.’ It is impossible to deny that by these principles (and we know no better) has the conduct of Sir Joseph Banks

been ever chiefly regulated in regard to the admission of new members. Against the specious philosophy of the theorist, the atheist, and the innovator delighting in mere change without regard of its consequences, Sir Joseph Banks had also to combat, and it was his duty to preserve the Royal Society from their intrusion.'

But by degrees the murmurs of the dissentient members burst out into a violent storm, when Dr. Hutton, professor of Mathematics at Woolwich, who filled the office of Foreign Secretary, having been accused of neglecting its duties, a rule was adopted requiring that the secretaries should reside in London. This led to the resignation of Dr. Hutton, he having first explained and defended his conduct, and a vote of the society approving of his defence. Several stormy meetings took place in which Dr. Horsley (afterwards Bishop of St. Asaph) was the prime organ of the opposition. He pronounced discourses and published writings of excessive bitterness. He predicted to the society and to science all possible misfortunes; and, supported by a few of the members of more consideration than himself, such as Maskelyne, the astronomer, he endeavoured to overthrow Banks. It was, however, happily, perceived that he wished to occupy his place, and this discovery tended more than anything else to allay irritation; for so intemperate a partizan appeared, even to his own friends, a misfortune more serious than any one of those they had predicted from the presidency of Sir Joseph Banks.

On the evening of the 8th January, 1784, a resolution that 'this society do approve of Sir Joseph Banks for their president, and will support him,' was moved in a very full meeting, by Sir Joseph's friends. It was strenuously opposed by several members, and in particular by Dr. Horsley, who, during the discussion, having been interrupted in a speech of great force and argument, and being further irritated by a suggestion from Lord Mulgrave, said:—

'We see that great numbers may be occasionally brought down to ballot upon particular questions, who do not honour the society with a very regular attend-

ance. We are well aware, Sir, that oppressive statutes may be framed in the council, and with this support in the society at large, received. We understand that motions personally offensive and injurious may be brought forward, and perhaps may be carried. And by these means the remedies which the scientific part of the society would wish to apply to the abuses which exist may be prevented. But, Sir, I am united with a respectable and numerous band, embracing, I believe, a majority of the scientific part of this society—of those who do its scientific business. Sir, we shall have one remedy in our power when all others fail: if other remedies should fail, we can at least secede. Sir, when the hour of secession comes, the president will be left with his train of feeble amateurs, and that toy (*pointing to the mace*) upon the table, the ghost of that society in which philosophy once reigned, and Newton presided as her minister.'

The motion made in favour of Sir Joseph Banks was carried by a great majority; a few of the dissentient members quitted the society; harmony and unanimity in the cause of science were again restored; and Sir Joseph Banks, during the long period of forty-one years¹, occupied this situation, (the highest to which a man of science can in this country aspire), with honour to himself, and benefit to the society and to science in general.

'Certainly,' says Cuvier, 'if we glance over the history of the Royal Society during these forty-one years, no cause will be found for the society to lament its choice of a president. During this epoch, so memorable in the history of the human mind, the scientific men of England occupy as glorious a position as those of any other nation, in the intellectual pursuits common to all civilized people. They have confronted the ice of either pole;—they have not left a spot of land in the whole

¹ This is the longest period that any one individual has occupied the presidency of the Royal Society. Sir Isaac Newton occupied it during twenty-four years.

ocean unvisited;—they have increased ten-fold the catalogue of the kingdoms of nature;—they have peopled the heavens with planets and satellites before unknown;—they have counted, as it were, the stars of the milky way;—and if chemistry has, in modern times, assumed altogether a new aspect, the facts which they have furnished have essentially contributed to the change;—hydrogen, oxygen, and carbonic acid, have been discovered by them;—to them also do we owe the decomposition of water;—new and singular metals, in great number, have resulted from their analysis;—the nature of the fixed alkalies was unknown until demonstrated by them. At their bidding the steam-engine and the science of mechanics have wrought miracles, and have placed their country above all others in almost every kind of manufacture; and if, as no reasonable man can doubt, such success is due much more to their physical energy, and to the general spirit of activity which pervades their nation, than to the influence of any individual, whatever his position, or however exalted his merits, it must nevertheless be admitted, that Sir Joseph Banks never abused his trust, or exerted his influence but for the good of mankind.

‘We may justly suppose that the influence of the president of such a society would be seen on its printed *Philosophical Transactions* rather than on the progress of science. But under his influence this collection became more rich, more exact, and assumed a form more worthy of so noble a work. To Sir Joseph Banks may we also trace the higher estimation in which this society was held by government, in proof of which, apartments were assigned in one of the royal palaces, for the accommodation of a body which does so much honour to the nation.’

These distinguished services were recognized with gratitude by impartial men, and public opinion sanctioned the rewards which government thought fit to bestow. On the 1st July, 1795, he was invested with the order of the Bath, and on the 29th March, 1797, admitted a member of his Majesty’s Privy Council.

These honours excited the ridicule of Dr. Walcott, the witty but unprincipled Peter Pindar, who supposing Sir Joseph to be admitted to the political councils, he was represented as running after butterflies whilst his colleagues were deliberating on the interests of Europe. The only remedy against such attacks as these was to laugh at them, and this the good sense of Sir Joseph enabled him to do.

It does not appear that he ever officially gave political counsel to the king; but he was no less a real and useful adviser. He entered into the rural occupations of his sovereign; acquainted him with the interesting productions of foreign lands, and cherished in him that love of nature which had already greatly benefitted science. The tastes of the sovereign have a great influence upon the people, for they are first imitated by the great, and then descend to every order of society. Thus during nearly thirty years England became, as it were, the centre of botanical science, and a sort of market to Europe for new plants and shrubs.

This confidence, engendered by similarity of occupation, gave to Sir Joseph many opportunities of doing good service to his country. Ministers often sought his assistance, in getting him to persuade his Majesty to consent to measures rendered necessary by political circumstances, to which the king had a strong natural repugnance. The importance of such a man was indeed great, but, to his honour be it said, that he never exerted his influence either to enrich himself or to gratify his vanity. Whatever of royal favour beamed upon himself he caused to be reflected on the sciences. Whenever an association was formed for a useful enterprise he hastened to take part in it; and for every work that required assistance in money, or support from authority, his aid might be safely calculated on. One authority, after mentioning the fact, that his purse was always open to promote the cause of science, says, ‘Many a traveller when in distant and inhospitable climes has drawn on his bounty: and such was the veneration in which his name was held, wherever it was known, that the draft was received like

specie, and it was generously honoured by Sir Joseph, though drawn without his permission.'

But M. Cuvier is most eloquent in his praise. He says:— 'Whenever opportunity arose for undertaking some important research, he indicated the means most likely to ensure success. Thus he revised and corrected the plans of all the great voyages of discovery undertaken during his time; he contributed essentially to the establishment of boards of agriculture; he was one of the first and most active members of the African association, and he never ceased to encourage and support those who attempted to penetrate this much-neglected portion of our globe. To his reiterated advice do we owe the expedition for the discovery of the north-west passage; and he was the cause that the attempts were persevered in, notwithstanding the bad success of the first trials; all the operations relative to the measurement of the meridian, whether by English or French labourers, were patronized by him; in the time of war as in the time of peace, he procured passports and friendly hospitality for those who most needed them: but that which it becomes us especially to celebrate in this place, is the indefatigable generosity with which he stepped in between enemies heated by the most violent passions, and softened the horrors of war for those who devoted themselves to scientific researches.

'At the breaking out of the American war, Louis XVI. gave orders that his vessels should everywhere show respect to captain Cook and his companions. To the honour of the age we live in, reviled and contemned as it has been, be it said that this noble example has become an article in the laws of nations; but it is chiefly to the constant zeal of Banks that we owe this great boon. Not only did he never lose an opportunity of getting the English government to comply with it; but more than once he even succeeded in persuading foreign governments to conform to it. From the first breaking out of the war which desolated Europe, he procured similar orders to be issued in favour of La Perouse, if he still existed; he caused inquiries to be

made for him in every sea. When discord had terminated the expedition of D'Entrecasteaux, and when the collections of M. de la Billardière were transported to England, he succeeded in procuring them to be given up to him¹; and not only did he hasten to restore them to their owners, but he accompanied his bounties with the singular delicacy of returning them unopened. He wrote to Jussieu that he would not carry off a single idea from a man who had procured these collections at the peril of his life. On no less than ten different occasions, collections addressed to the Jardin du Roi, which had been captured by English vessels, were recovered by him, and restored in a similar manner; he even sent as far as the Cape of Good Hope to procure some chests belonging to Humboldt, which had been seized by corsairs, and on all these occasions he would not allow himself to be reimbursed; he seemed to feel that he was, as it were, answerable for the outrages committed by his countrymen on science and the arts, and that his duty extended even to the reparation of the injuries which other nations did to science. Having learned from the public papers that Broussonnet had been obliged to fly from his country in order to save his life, Sir Joseph

¹ The uncertainty of the fate of Perouse, the French navigator, had long interested the scientific world, and the French government had sent out an expedition in search of him, under the command of D'Entrecasteaux, aboard of which was the naturalist de la Billardière. During their absence the revolution took place: D'Entrecasteaux also died, and was succeeded in the command by M. Dauribeau, who, hearing of the change of politics, on their arrival at Java determined to hoist the white flag, a circumstance disagreeable to de la Billardière and some others of the officers. The Dutch were then at war with revolutionary France, and de la Billardière was given up to them as a prisoner, and his journals and collections taken possession of. He was afterwards permitted to go to the Isle of France, from whence he sailed for Europe, and arrived in 1796; soon after which he received information that his collections of natural history had been sent to England. The French government immediately put in their claim for them, which was most generously seconded by Sir Joseph, with all the exertions, as de la Billardière acknowledges, 'that were to have been expected from his known love for the sciences.' In this he was successful, the British government feeling the same liberal principles, and acting as they did afterwards on several similar occasions.

Banks gave orders to his correspondents in Spain to supply all his wants; and a friendly hand and an open purse awaited him at Madrid, and again at Lisbon, and followed him as far as Maroe. When the distinguished mineralogist Dolomière, by the most unjust violation of the laws of nations, in order to gratify the vengeance of an angry woman, was cast into the dungeons of Messina, it was the ingenious humanity of Banks that first penetrated the subterranean prison, where, concealed from all mankind, he languished in despair, and whispered solace to his affliction, and gave him tidings of his country and of his family; and if his benefactor did not succeed in procuring him his liberty, it was not for want of zeal in attempting all possible means with the government that so unjustly detained him. And the zeal which Banks displayed for the scientific sons of France was not less exerted for his own countrymen. Every one remembers that other violation of the rights of nations, by which thousands of Englishmen, resident or travelling in France, were suddenly declared prisoners of war. Banks hastened to discover all those in whose favour some scientific occupation or title could be alleged, and he called upon the Institute of France to assist him in supporting his demand for their liberation, and the Institute did not examine with very nice care the claims advanced in favour of the liberation of numerous persons. By these means many were released from a captivity that might have proved fatal.

‘Nothing we think seems to prevent us from pronouncing a judgment on the character of Sir Joseph Banks that posterity will not sanction. We may without reserve admire his courage in perilous enterprises;—his noble employment of the favours which fortune had poured out upon him in supporting all that was useful;—the exemplary assiduity with which he discharged the duties of his honourable station, and the amenities which he introduced into the personal intercourse of the friends of science;—the generous solicitude which he displayed towards those whom misfortune pursued;—and when we consider how high a place he

occupied in public esteem, and in spite of the detractions of envy, how well he has been recompensed by that pure happiness which always results from the untiring exercise of an active benevolence, we feel it to be an especial duty to offer his character as an example to that comparatively large class—men of wealth and station—who wear out their time in indolence, which is wearisome to themselves, and mischievous to others,—time, which from their means and position might be so easily and so happily employed in promoting the cause of humanity.’

In return for the numerous acts of disinterested kindness which Banks had shown to scientific foreigners, he was elected, in 1802, a member of the National Institute of France. In his reply to the letter which announced this honour, he expressed himself in terms which gave great offence to several members of the Royal Society; he was also attacked by an anonymous writer (afterwards acknowledged to be Bishop Horsley), in a most virulent strain; and the motives for this attack seem to have arisen rather from the remembrance of the old feud than from patriotic jealousy.

The judicious and unwearied kindness of Sir Joseph Banks towards individuals in whom he detected real merit, even though that merit was obscured by a rough exterior, and uncultivated manners, is well illustrated by his conduct towards George Caley, the son of a horse-dealer in the north of England, whose early predilection for botanical pursuits led him first to study indigenous plants, and then to seek and obtain an appointment as collector in foreign regions. Caley was placed for about four years at the free grammar-school at Manchester, but was at an early age condemned to the drudgery of the stable. Having picked up an odd volume of Gibson’s *Farriery*, containing some anatomical figures, he soon saw that the farriers he had met with were very ignorant of the true method of treating horses, and he began to collect the herbs mentioned by his author as necessary to make up several prescriptions. As soon as he had done this, he wished to know

more about plants, and collected petty herbals, and afterwards botanical treatises. He also began to find out botanical companions, no difficult thing in Manchester, where many of the weavers exhibit a great ardour and devotion to this science. He even learned to weave, that he might have more time at his own disposal than the incessant drudgery of the stable would permit. He thus enlarged his knowledge, especially of plants used in manufactures. He purchased the *Genera Plantarum*, and other botanical works, and was at great pains to learn enough Latin to understand the technical names. His first application to Sir Joseph Banks is thus described by himself. ‘Now the idea of visiting foreign parts began to enter my mind: I thought of going to sea, but not having a nautical education, and could not confine my mind to it, I considered it would be rashness. It was not long before it entered my head to write to Sir Joseph Banks. At length he sent me an answer: the result was, that he knew of no other method than to be employed in a good botanic garden; and if I made a proper progress, he would give me farther assistance. I did not much like the thoughts of working in a garden, for that would be out of my element; and being tied to regular hours was not like working piece-work, knowing what I had to do, and then giving over. However I stood it as well as might be expected till I went to Kew; which place, I do sincerely acknowledge, I could not weather: not through the hardship of the work, but from being debarred from cultivating my mind according to its natural inclination.’ This dislike of his situation at Kew led to a series of remonstrances with the president of the Royal Society, which were neither judicious nor respectful on the part of Caley. He vainly attempted to convince Sir Joseph that no such initiatory process as that he was undergoing was necessary in his case; but that he was already qualified for the office he most particularly desired, namely, that of a botanical traveller. His importunity on this occasion is the more remarkable, as he was a man of excessive modesty: he must have been intensely earnest

on his principal object, so to overcome the natural retiredness of his disposition. Not being able to convince the president on the point in question, Caley retired in disappointment and chagrin to the wilds of Lancashire. But here the kindness of Sir Joseph Banks still followed him, as will appear from the following extract of a letter of advice, written by the baronet from Soho-square, July 16, 1798: 'I told you when I first wrote to you, that unless you would gain your livelihood as a gardener, while you made yourself acquainted with the plants cultivated in the gardens here, I did not mean to get employment for you as a botanical traveller. By so doing I put you in the same situation as Aiton, Lee, Dixon, and Mason were in, when they were of your age; all of whom, at that period, gained their livelihood in the gardens without complaining. How you can be useful as a botanical traveller, to send home seeds and plants, till you have made yourself acquainted with those already in England, I do not know. We have now several hundreds of such; and to send them again would be idle and useless. You might discover some drug valuable in dyeing or medicine for your own advantage; but unless you are able to benefit your employer as well as yourself, how can you expect employment?

'You are certainly, however, eminently capable of searching the woods with diligence and advantage for dyeing drugs and other matters likely to be advantageous to manufacturers and trade; and that many such things remain unknown in the unexplored wilds of a country larger than all Europe, is a matter of infinite probability. If the gentlemen of Manchester will make a subscription to maintain you in that employment, on such terms as shall be agreed upon between you and them, I will readily become a subscriber, and use my best influence with government to send you out at the public expense, in which I have no doubt of being successful.'

The plan thus kindly suggested by Sir Joseph was not forwarded by the gentlemen of Manchester, and Caley began to despair of attaining his object. The difficulties thrown in his way, together with the judi-

cious advice of the president, had, no doubt, a beneficial effect on his mind, and led him to continue those studies which were necessary to fit him for future usefulness. In November 1798, the welcome mandate at length arrived, and Caley was hastily summoned by his true friend Sir Joseph Banks to embark for New South Wales, where he was supported ten years at his patron's own expense, and where he collected a great number of valuable specimens in every branch of natural history. His primary duties were the collecting of plants for his patron, and seeds for the garden at Kew, with the use of duplicates for himself; but, so greatly did he extend his field of action, that the most splendid portion of the museum of the Linnæan Society consists of quadrupeds, birds, and reptiles, collected by this indefatigable man. The benefits thus accruing to society may be mainly traced to the calm and benevolent proceedings of Sir Joseph Banks, which, while they restrained the rashness of youthful enthusiasm, assisted the developement of real talent, and granted protection and pecuniary resources just at the period when they could be most advantageously employed.

Sir Joseph Banks continued, during many years, to enjoy the esteem of the public and the pure delights of domestic life. His venerable mother lived till the year 1804; an accomplished sister accompanied him nearly to the close of his life; and an amiable wife rendered his home lovely. Nature as well as fortune seemed to have favoured him. 'His person was tall and manly, and his countenance expressed dignity and intelligence. His manners were polite and urbane; his conversation rich in instructive information; frank, engaging, unaffected, and without levity, yet endowed with sufficient vivacity. His information was general and extensive. On most subjects he exercised the discrimination of an original and vigorous mind; his knowledge was not that of facts merely, or of technical terms and complex abstractions alone, but of science in its elementary principles and of nature in her happiest forms.' During his latter years he was grievously afflicted with the gout, so much so as at

times to lose the use of his lower extremities, but it was not able to exert any influence on his mind or his temper. On the 19th June, 1820, at his house at Spring Grove, he closed a life which had been consecrated to the progress of science, and his dying bequests had reference to the same cause. He bequeathed to the British Museum his rich library of natural history, the result of fifty years of assiduous research; the catalogue of which, prepared under his own direction, by Mr. Dryander, has rendered it celebrated throughout Europe, and useful even to those who have not access to the books themselves, on account of its admirable arrangement, and the analysis under distinct heads of the contents of every work. Of this library, which was more accessible than that of any public institution, Dibdin thus writes in his *Bibliographical Decameron*: ‘The incomparable library of natural history of Sir Joseph Banks, in which, as in a wood of ancient growth and primeval grandeur, amidst insects of all hues, reptiles, either nocuous or innocent, and wild beasts that walk abroad or love the lair, you may disport at ease, and solace yourselves without injury and to your heart’s delight. Such a collection should not be merely formed to be dissipated; as neither years nor centuries can erase the name of the owner of it from the records of imperishable fame.’

The age of Sir Joseph at his death was seventy-seven years. He was buried at Heston in Middlesex. Lady Banks survived her husband a few years, and having no children the title at her death became extinct.

In addition to his office of president of the Royal Society, Sir Joseph Banks was an official trustee in the management of the British Museum, the duties of which office he discharged with his accustomed zeal. He was constantly consulted in the affairs of the Board of Trade, of the Board of Agriculture, and of the Mint, and he also took a leading part in the management of the Royal Gardens at Kew. He also contributed greatly to the interests of the Horticultural Society, founded in 1804.

Sir Joseph Banks published a number of short articles in the *Transactions of the Horticultural Society*, of which the following is a list:—1. An attempt to ascertain the time when the potatoe was first introduced into this country, with some account of the Hill-wheat of India. 2. Hints respecting the proper mode of injuring tender plants to our climate. 3. On the revival of an obsolete method of managing strawberries. 4. An account of the method of cultivating the American cranberry at Spring Grove. 5. On the horticultural management of the sweet or Spanish chestnut-tree. 6. On the forcing-houses of the Romans, with a list of fruits cultivated by them now in our gardens. 7. Account of a new apple called the Spring-grove-codling. 8. On ripening the second crop of figs that grow on the new shoots. 9. On the first appearance of the apple-tree insect in this country. He also communicated several short articles to the *Archæologia* of the Society of Antiquaries; and published, in 1805 and 1809, two tracts, the first of which has been several times reprinted, viz. *A short Account of the Cause of the Disease in Corn, called by the Farmers the Blight, the Mildew, and the Rust*. The other tract was entitled, *Circumstances relative to Merino Sheep, chiefly collected from the Spanish Shepherds*. In the printed communications to the Board of Agriculture he also published an ‘Account of experiments in cultivating Rice brought by Sir John Murray from India,’ and, ‘Observations on Spring Wheat.’

The distinguished botanist, Robert Brown, was engaged by Sir Joseph Banks during several years as his librarian, and in the preparation of some botanical works. The regard in which he was held will be seen by the following abstract of the will of Sir Joseph Banks, which, in other respects, will also be read with interest.

By his will, he expressly desires that his body be interred in the most private manner in the church or church-yard of the parish in which he shall happen to die, and entreats his dear relatives to spare themselves the affliction of attending the ceremony, and earnestly

requests that they will not erect any monument to his memory. He bequeathed the greater part of his property to Lady Banks. But the most remarkable part of this document are the two codicils, by the first of which, dated 21st January, 1820, he gives to his indefatigable and intelligent librarian, Robert Brown, Esq., an annuity of two hundred pounds, and also the use and enjoyment during life of the library, herbarium, manuscripts, drawings, copper-plates engraved, and everything else that is contained in his collections usually kept in the back building of his house in Soho-square; and after the decease of the said Robert Brown, then he gives the same to the trustees for the time being of the British Museum; or if it be the desire of the said trustees, and the said Robert Brown shall consent to have the same removed to the British Museum in his lifetime, he shall be at liberty to do so; and the said Robert Brown to be provided with the proper means of access thereto for himself and his friends. And he declares that the aforesaid bequests in favour of the said Robert Brown are upon condition that he continue to use his library as his chief place of study in the manner he now does, and that he assists the superintendent of the Royal Botanic Gardens at Kew, and continues to reside in London, and does not undertake any new charge that may employ his time.

To Mr. Frederick Bauer, of Kew-green, who had been employed by Sir Joseph as a draughtsman for thirty years, he gave an annuity of three hundred pounds, upon condition that he continue to reside at Kew-green, and employ himself in making drawings of plants that flower in the collection at Kew, in the same manner as he has hitherto done; and the drawings which he shall so make to be added to the collection in his hands, and which revert to Sir Joseph or his representatives at the time of his death. It is the wish of the testator, that if any doubts should arise as to his meaning in the conditions imposed on Mr. Brown and Mr. Bauer, the same shall be construed in a manner so as to be most favourable to them.

By a second codicil, dated 7th March, 1820, he gives to his Majesty, for the use of the establishment of the Royal Botanical Gardens at Kew, all the drawings and sketches of plants that have grown in the said gardens, and have been made at his expense by Mr. Bauer, and which are now deposited in his custody, deeply impressed with an opinion, which he still continues to hold, and believes to be founded in truth, that the establishment of a botanic garden cannot be complete, unless a resident draughtsman be constantly employed in making sketches and finished drawings of all new plants that perfect their flowers or fruits in it; and declares that he long ago determined to fix such a person at Kew, and maintain him at his own expense, and he accordingly engaged Mr. Bauer, whose collection of drawings and sketches he trusts will prove a valuable addition to the important science of natural history: that he did this under a hope that the truth of his opinion would in due time become manifest, and that the charge of maintaining Mr. Bauer would then be transferred from him, and placed on the establishment of the garden: but in case his Majesty's advisers should deem inexpedient this small addition to the establishment, he charges on his Lincolnshire estates the annuity of three hundred pounds to Mr. Bauer.

Sir Joseph Banks having died in the month of June, and the general election of officers for the Royal Society not taking place until November, it was necessary to provide a president during the interval. The council accordingly placed Dr. Wollaston in the chair. It was considered that both he and Sir Humphry Davy were equally entitled to the honour of the situation, and equally well calculated for the discharge of its duties; but Dr. Wollaston having signified his fixed determination to decline competition, gave the whole weight of his influence to Sir Humphry Davy.

CHAPTER IV.

HISTORICAL NOTICE OF THE ROYAL SOCIETY AFTER THE DEATH OF SIR JOSEPH BANKS.

Sir Humphry Davy is Candidate for the Presidency—Is elected—His Address to the Society—His Discourses—His Scientific Soirées—Anecdote—Annoyances to which he is exposed—His Resignation—Mr. Davies Gilbert elected—The Royal Medal awarded to Sir Humphry Davy—Resignation of Mr. Davies Gilbert, and Election of H. R. H. the Duke of Sussex to the Presidency—Extracts from his Anniversary Addresses: 1. On the Duties of the President; 2. On the Royal Society and English Men of Science; 3. On the Royal Medals—Resignation of H. R. H. the Duke of Sussex—Election of the Marquis of Northampton—Improvements in the Society—Revision of the Statutes—Additions to the Library—The Arundel Manuscripts exchanged for Books—Formation and Publication of Catalogues of the Books, MSS. and Instruments of the Society—Publication of Abstracts of Papers read before the Society.

ON the death of Sir Joseph Banks, Sir Humphry Davy came forward as a candidate for the office of president of the Royal Society. We are assured by his brother that, although the dignity was, doubtless, attractive to him, (for it was surely an honourable ambition to occupy a place which had been filled by Newton,) yet he conceived that his powers of usefulness would be increased; that he should be able to give an impulse to science, and forward its advancement by example and exhortation; he also hoped to be able to prevail with the members of his Majesty's government to afford to science some substantial support worthy of the cause and worthy of the country, which, to the resources of science, had hitherto contributed so little and had owed so much¹.

¹ *Memoirs of the Life of Sir Humphry Davy, Bart., by his brother, Dr. John Davy*, to which work we are indebted for some of the details of this chapter.

Other candidates for the office were spoken of, and for two of them their friends had canvassed; but the competition was of short duration. On the 30th November, 1820, the day of election of the officers of the society, there was a very full attendance of the fellows, on the rare occasion of voting with open lists; the result of the ballot was almost unanimous in favour of Sir Humphry Davy, and he was accordingly pronounced duly elected by Dr. Wollaston, who was then acting president; and, for seven years afterwards, he was successively re-elected without the least opposition.

‘I was with him,’ says Dr. Davy, ‘the whole of the day of his first election, and can record with pleasure how tranquilly he passed it: in the morning he had no apprehension of failing of success, and in the afternoon he showed no undue exultation in having obtained it. Before going to the public dinner of the society, held on the anniversary of the election of its officers, he prepared an address, and the speeches it would be required of him to make, as was always his custom when he had to speak in public; for he held that preparation was necessary to speak well. The dinner was very crowdedly attended; and the manner in which his speeches were received, for so grave a body, was quite enthusiastic. On the first regular meeting of the society after St. Andrew’s day, on his taking the chair, he delivered an address “On the Progress and Objects of Science,” in which was well displayed his peculiar style of poetical illustration, his comprehensiveness of mind, and power of discrimination. Without lowering other societies, he upheld the Royal Society as the elder brother, and its *Transactions* as the most proper place for the publication and preserving of important discoveries in all the branches of natural knowledge. He wished that, as they had been hitherto, so they should continue to be, the record of British science. The concluding part of this address is so characteristic of the tone of his mind, and of the views and hopes he delighted to indulge in, that I shall transcribe it:—

“Gentlemen, to conclude. I trust in all our researches, we shall be guided by that spirit of philosophy,

awakened by our great masters, Bacon and Newton ; that sober and cautious method of inductive reasoning, which is the germ of truth and permanency in all the sciences. I trust that those amongst us who are so fortunate as to kindle the light of new discoveries, will use them, not for the purpose of dazzling the organs of our intellectual vision, but rather to enlighten us, by showing objects in their true forms and colours ; that our philosophers will attach no importance to hypotheses, except as leading to the research after facts, so as to be able to discard or adopt them at pleasure, treating them rather as parts of the scaffolding of the building of science, than as belonging either to its foundations, materials, or ornaments ; that they will look, where it be possible, to practical applications in science—not, however, forgetting the dignity of their pursuit, the noblest end of which is to exalt the powers of the human mind, and to increase the sphere of intellectual enjoyment, by enlarging our views of nature, and of the power, wisdom, and goodness of the Author of Nature.

“ Gentlemen, the society has a right to expect from those amongst its fellows gifted with adequate talents, who have not yet laboured for science, some proofs of their zeal in promoting its progress ; and it will always consider the success of those who have already been contributors to our volumes, as a pledge of future labours.

“ For myself, I can only say that I shall be most happy to give, in any way, my assistance, either by advice or experiments, in promoting the progress of discovery ; and though your good opinion has as it were honoured me with a rank similar to that of general, I shall always be happy to act as a private soldier in the ranks of science.

“ Let us then labour together, and steadily endeavour to gain what are, perhaps, the noblest objects of ambition—acquisitions which may be useful to our fellow-creatures. Let it not be said that at a period when our empire was at its highest pitch of greatness, the sciences began to decline ; let us rather hope that

posterity will find in the *Philosophical Transactions* of our days proofs that we were not unworthy of the times in which we lived."

'This discourse was published in 1827, with five others which were successively delivered at the opening of the winter session of the society, when the award of its medals is decided by the president and council, and these are presented to the individuals distinguished from the chair. In delivering a discourse on these occasions, he merely persisted in doing what his predecessors in office had before done; but he was, I believe, the first president of the society who noticed publicly the fellows deceased during the year, and briefly described their character and merits as men of science. This he did not only to indulge his own kind feelings, and as far as possible contribute to the rendering of just honours to deceased worth, but also for the purpose of keeping alive the spirit of philosophical inquiry and the love of scientific glory, "and of kindling and perpetuating that flame of science which in the Royal Society ought to be undying." How he executed this work may be seen in the published *Discourses*, which were printed as they were delivered. They constitute good specimens of his style of oratory, and remind me forcibly of his lectures in the theatre of the Royal Institution; but the mere reader of them will form but an imperfect idea of their effect when delivered on an occasion appropriate, in the tone of voice and animation which the occasion called forth, addressed to individuals honoured by the highest marks of respect the society can shew, and to an audience capable of appreciating the justness of every remark; and in the instance of the eulogies spoken on lately deceased fellows, sure of awakening kindred sympathies, and the kind and tender recollections of a large part of his audience.

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'The meetings of the society this year were unusually well attended. Some of the fellows who had withdrawn during the time of Sir Joseph Banks, owing to the angry contentions which took place in the

early period of his presiding, now resumed their attendance; and general harmony and apparent satisfaction prevailed. * * * As it had been the custom of former presidents to observe a certain state in all that related to their office, conceiving, no doubt, that it helped to maintain its dignity and respectability, my brother did not depart from their example, and he continued to take the chair in a full court-dress, to have the splendid mace of office placed on the table before him, and to sit covered.

His predecessor had, for many years, an evening party at his own house, for the purpose of assembling men of science, and affording them an opportunity of meeting each other at a fixed time and place. My brother continued this practice, changing only the evening of the meeting from Sunday to Saturday; the former appearing objectionable to some individuals, and he preferring one to which no objection could be made, especially of the serious kind of interfering with a day which should be set aside for devotional purposes. These evening parties were very similar to those of Sir Joseph Banks; and as long as I was in England, they were crowdedly attended, and were very agreeable, amusing, and useful. They brought together not merely men of science, but also literary men, poets, artists, country gentlemen; and they were very attractive to foreigners. The subjects of interest of the day were there discussed, and curious information obtained from the best sources, and knowledge exchanged between individuals as in a great mart of traffic, each giving and receiving according to his acquirements and wants. There the physiologist and naturalist might collect curious particulars from an African traveller, or Arctic navigator, respecting many objects of his particular enquiries, and give hints for further investigation, or solve questions which might have perplexed the original observers. An evening seldom occurred without some novelty in art, science, or nature, being brought forward,—as the bones from the Kirkdale Cave, or a new chemical compound, or a magnetical experiment, or a recently-discovered mineral, or some

new instrument or apparatus; and a great zest was given by the presence, as was generally the case, of the inventor or discoverer, who was always willing to offer explanation, and give detailed information to those who were desirous of receiving it. And, moreover, a stimulus was thus imparted—a fresh excitement to the mind to continue and perfect useful investigations; and aids were often given which greatly contributed to the successful termination of scientific labours.

‘In these parties the distinctions of society seemed very much to be lost in the distinctions which science and merit confer. Men of the highest rank in the country mingled with men without any claim to notice, excepting that high one of superior knowledge; and it was a noble thing to see how much more attractive it was, and more honoured, than the highest nobility destitute of this qualification. I remember one evening when the company was reduced to a small number by the lateness of the hour, and those who remained had collected round the fire, one of the party, I believe it was Dr. Young, observed in playful remark, ‘Ah! I perceive all here are doctors:’ and so it proved; there being two or three doctors of physic—one, I believe, of divinity, and three of civil laws; and of these last two were baronets, and one was an earl, who, though distinguished for his high bearing on ordinary occasions, on this occasion seemed pleased to be considered of the same grade as the rest.’

Sir Humphry Davy resided, at this time, at No. 28, Lower Grosvenor-street, and as long as he remained in that house he continued to give these weekly evening parties during the session of the society. In the year 1826, when he removed to No. 26, Park-street, Grosvenor-square, they were discontinued; and as a substitute, the library of the Royal Society, in its apartments at Somerset-house, was opened on Thursday evenings, after the regular meeting was concluded, where the fellows and visitors could converse familiarly on matters of science. ‘So long as his health permitted, he continued to give the dinners which were expected from

him as president, to which were invited principally the working fellows of the society. The plate which was used on these occasions was very appropriate, consisting chiefly of honorary plate, and principally of the handsome service which was presented to him in 1817, by the great proprietors of collieries in the north of England, for his discovery of the safety-lamp.'

Dr. Davy refers to certain annoyances experienced by his brother during his presidency, but as these are of a somewhat personal nature, they need not occupy attention here. But we may notice one source of annoyance, to which the president of an important scientific society seems likely to be always exposed, namely, 'the perpetual interruption of his leisure, from applications by letter, and personally, without end, respecting trifling inventions, supposed by their authors to be important discoveries, respecting patents and certificates for patents, and about imaginary discoveries, and schemes worthy of Bedlam, and generally proposed by men of unsound, and often insane mind. To be thus deprived of time, and to have attention and patience wearied, must have been disagreeable to any man, excepting of a trifling character, and to my brother it was particularly wearying, and it even interfered with his own pursuits, and deprived him very much of the leisure which he might have devoted to original research. As an honorary situation, without profit or emolument of any kind, but occasioning considerable expense to the individual, a stranger to the nature of its duties would suppose the office of president of the Royal Society, for a man of science, not only the most elevated but the most agreeable possible. It undoubtedly should be so; but it never can be, so long as pretension to knowledge, vanity, and presumption, are more common (and they will always be more intrusive) than real knowledge, modesty, and diffidence. The pleasures of office, and especially of honorary office, are generally in anticipation and imaginary—the trials and troubles real and incessant.'

After having filled the office of president during

seven years, with honour to himself and benefit to science, the illustrious chemist was compelled, through ill health, to resign. He was travelling in Austria for the benefit of his health, and announced his intention, in a letter to Mr. Gilbert, dated Salzburg, 30th June, 1827. After describing his illness, he says, ‘Under these circumstances I feel it would be highly imprudent, and perhaps fatal, for me to return, and attempt to perform the official duties of president of the Royal Society; and as I had no other feeling for that high and honourable situation, except the hope of being useful to society, so I would not keep it a moment without the security of being able to devote myself to the labour and attention it demands. I beg, therefore, you will be so good as to communicate my resignation to the council and to the society at their first meeting in November, after the long vacation, stating the circumstances of my severe and long-continued illness as the cause. At the same time, I beg you will express to them how truly grateful I feel for the high honour they have done me, in placing me in the chair for so many successive years. Assure them that I shall always take the same interest in the progress of the grand objects of the society, and throughout the whole of my life endeavour to contribute to their advancement, and to the prosperity of the body. * * *

It was my intention to have said nothing on the subject of my successor. I will support, by all the means in my power, the person that the leading members of the society shall place in the chair; but I cannot resist an expression of satisfaction in the hope you held out, that an illustrious friend of the society,—illustrious from his talents, his former situation, and, I may say, his late conduct,—is likely to be my successor.’

In consequence of this letter, the council of the Royal Society, by a resolution passed at a very full meeting held on the 6th of November, 1827, appointed Mr. Davies Gilbert to fill the chair, until the general body should elect a president. At the anniversary meeting on the 30th November following, Mr. Gilbert was re-elected. On this occasion the society testified

their admiration and respect for their late president, Sir Humphry Davy, by awarding to him one of the royal medals. In his address, Mr. Gilbert said :—

‘It is with feelings the most gratifying to myself, that I now approach to the award of a royal medal to Sir Humphry Davy: and I esteem it a most fortunate occurrence that this award should have taken place during the short period of my having to discharge the duties attached to the office of president; having witnessed the whole progress of Sir Humphry Davy’s advancement in science and in reputation, from his first attempts in his native town to vary some of Dr. Priestley’s experiments on the extrication of oxygen from marine vegetables, to the point of eminence which we all know him to have reached.’

Then, after sketching the scientific labours of Sir Humphry Davy, he concludes thus:—

‘Sir Humphry Davy having last year communicated a paper to the society in continuation of his former inductions and generalization on chemical and electric energies, there cannot be a doubt but that the only obstacle against his then receiving a royal medal on the first occasion that the society had it to bestow, was his occupying this chair. That obstacle, unhappily for science, no longer exists; and the Royal Society take this earliest opportunity of testifying their high estimation of those talents and of those labours which all Europe admires. We trust and hope, although our late president has been induced by medical advice to retire from the agitation of active public stations, that his most valuable life will be long spared; and that energies of mind may still be displayed to this society and to the civilized world, equal to those which have heretofore rendered immortal the name of Davy.’

In the year 1830, Mr. Davies Gilbert retired from the chair of the Royal Society, and at the anniversary meeting on the 30th November, in the same year, his Royal Highness the Duke of Sussex was declared to be duly elected to the presidency.

At the ensuing anniversary meeting his Royal

Highness addressed the fellows in a speech of great beauty and interest, from which we select the following passages on the duty of the president of the Royal Society.

‘The chair of the Royal Society has been filled by a rare succession of illustrious men, and I feel proud that I have been judged worthy, upon any grounds, to occupy a situation which has become dignified by its association with the names of those who have conferred so much honour upon our country. It is indeed true that I can enter upon no competition with such predecessors, as respects scientific knowledge, which my early education, my public occupations, and even the duties of my rank, have prevented me from cultivating and attaining to that extent I could have wished ; but I should do no honour to your kindness, which has placed me in this high and dignified station, if I should profess that I considered myself wholly inadequate to the efficient discharge of many at least of its public duties, or that I felt my occupation of this chair was likely to prove injurious either to the credit of the society, or to the advancement of science. If such, indeed, gentlemen, were my own persuasion, I would not continue to fill this honourable post for another hour.

‘The ostensible duties, in fact, of your president, are chiefly ministerial : he is your organ to ask and receive your decisions upon the various questions which are submitted to you ; and he is your public voice to announce them. Though he presides at the meetings of your council, he possesses but one voice among many ; incurring an equal responsibility in common with every one of its members. He is your official representative in the administration of the affairs of the British Museum : he presides in your name by virtue of your election of him, at the board of visitors of the Royal Observatory, as appointed by his Majesty’s warrant : he is your medium of communication with public bodies, and with the members of the government, upon the various subjects important to the interests of science, which are either submitted to your consideration, or

which are recommended by you through your council, for the consideration of others. For many of those functions I feel myself to be somewhat prepared by my habits of life, as well as by my public occupations: and for some of them more especially, if I may be permitted to say so, by that very rank in which providence has placed me as a member of the Royal Family of this country; for though it would be most repugnant to my principles and my wishes, that the weight of my station should in any way influence the success of an application which it was either improper to ask, or inexpedient to grant, I should feel it to be equally due to the dignity of this society and to my own, that the expression of your opinions and of your wishes should experience both the respect and the prompt attention to which it is so justly entitled.'

The following interesting observations on the Royal Society and English men of science were made in the anniversary address of His Royal Highness the president, on the 30th November, 1832.

'One of the most illustrious of modern mathematicians and philosophers, himself a foreigner, has said that the Royal Society has contributed more to the progress of science than the combined labours of all other similar institutions: and though it would be unfair to interpret too literally the language of a compliment, yet it would not be very difficult to vindicate its general truth and justice.

'It was this society which fostered and encouraged the early labours of Newton, and under its auspices was published the work which constitutes, and probably ever will constitute, the proudest monument of the genius of man: and from the period which immediately followed its foundation, the age of Wallis, and Newton, and Wren, and Hook, and Halley, and Taylor, to that of Herschel, and Cavendish, and Wollaston, and Young and Davy, its *Transactions* contain records of almost every important discovery in natural philosophy; of almost every experimental inquiry which has been most remarkable for its difficulty, delicacy, or impor-

tance, and of almost every original speculation which has most contributed to the advancement of science.'

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'There are some reasons which I know may, and very probably will be urged against the reasonableness of expecting that any considerable number of men of science should be able, however willing they might otherwise be, to devote any large portion of time or labour to the service of any society, let its claims upon them be ever so strong.

'In this country, where wealth is the general measure of the social rank of families at least, if not of individuals, men of science must either possess an independent fortune, or they must pursue it, as is most generally the case, in connexion with a laborious profession; for we have few establishments which afford them support, independently of other employments; and even in those very rare cases the provision which is made is so small, that no man of superior education can look forward to the attainment of the advantages which science and learning offer, in forming his scheme of life, unless he be prepared to make the most serious sacrifices. It is for this reason that the learned professions, presenting as they do the most brilliant prospects of rank and wealth, generally absorb, in the progress of life, the studies and exertions of young men of the highest scientific education and promise; for, however strong may have been their attachment to the studies of their youth, and however ardent their ambition to obtain the honours of science, they soon find that such pursuits retard their professional advancement. In other countries, however, where the learned professions are neither richly paid nor highly honoured, and where the exclusive cultivation of particular branches of literature and science presents the readiest access to the possession of competence and social rank, we find large bodies of men who have no professional engagements whatever to divert them from their literary and scientific labours, which are thus made to constitute the business of their lives. I am fully sensible of the

great advantages which other countries possess in these respects above our own, and that it is quite impossible for us to command an equal concentration of attention to the advancement of particular branches of science, or to the concerns of a particular society; still less so when it is considered that those services must with us be afforded gratuitously, which, in other countries, are remunerated by the state, or are required as part of the duty of a salaried office:—we are not less called upon, however, on this account to make the best and most efficient use of the means in our power, and the assistance which we cannot command as due from a sense of official or professional obligation, we may receive as rendered from a higher feeling of devotion to the promotion of the general interests of science, and with it of our national fame.’

In the anniversary address of His Royal Highness the president, in the year 1833, some interesting particulars are stated respecting the medals founded by George IV. in the year 1825. It was intended that His Majesty’s effigy should form the obverse of the medals; and that two medals from the same die should be struck upon each foundation, one of gold, and the other of silver. It was his Majesty’s intention that these medals should be adjudged for the most important discoveries, or series of investigations completed and made known to the Royal Society, in the year preceding the day of their award; and that their presentation should not be limited to British subjects.

Upon proceeding to distribute the medals, it was found that the limitation of time (one year) interfered materially with the proper observance of the object proposed to be secured by their foundation; the period was therefore, with his Majesty’s sanction, extended to five years. In accordance with this arrangement the medals continued to be awarded, until the year 1830, inclusive, when the demise of his late Majesty took place.

‘Mr. Chantrey, to whom, in conjunction with Sir Thomas Lawrence, was intrusted the selection of the subject for the medal, furnished the cast for the medal-

lion of the head of his late Majesty, which was to form the obverse of it, while Sir Thomas undertook to compose the design for the reverse. Unfortunately, that distinguished artist, either from over-delicacy, or over-anxiety to produce a work of art worthy of the object for which it was intended, or from that spirit of procrastination which was unhappily too common with him, delayed its execution from year to year, and died without leaving behind him even a sketch of his ideas respecting it; though the character of such a design as would be at once classical and appropriate to the purpose, was the subject of frequent conversation, and even of favourite speculation with him. From these and other causes, to which it is not necessary for me now to advert, it arose, that, at the demise of his late Majesty, although the adjudication of ten medals had been formally made and announced from the chair of the Royal Society, not even the dies, much less the medals, were forthcoming for the purpose of distribution to the various distinguished persons, some of them foreigners, to whom they had been awarded.

‘It cannot be necessary for me to impress upon you, gentlemen, that the non-completion of an engagement so solemnly entered into with the whole republic of men of science, would have brought discredit not merely upon the Royal Society, but upon the personal honour of a monarch of this country, whose name it is our especial duty, as fellows of the Royal Society, to hand down unsullied to posterity, as our munificent patron and benefactor; and as no funds had been placed at the disposal of our treasurer, nor in the hands of any other ostensible person, to meet the very heavy expenses which must be incurred for cutting the dies and furnishing the medals already awarded, I felt it to be my duty, when I succeeded to this chair, to recommend to the council the suspension of any further adjudgment of the medals until I could have an opportunity of ascertaining the nature of the commands which had been issued concerning them, by the late sovereign, through his official advisers or otherwise, and also of taking the

pleasure of his present Majesty respecting their continuance in future, and the conditions to which they should be subject. These inquiries terminated in the most satisfactory manner. On a proper application to those who were interested with the ultimate arrangement of his late Majesty's affairs, prompt measures, as far as lay in their power, were adopted for the immediate fulfilment of every pledge which it was conceived had been given to the Royal Society, and to the public at large, in the name of George the Fourth.

'The dies for the medals upon the old foundation are now completed, and ready for distribution; they bear upon the one side the likeness of his late Majesty, while the reverse represents the celebrated statue of Sir Isaac Newton, which is placed in the chapel of Trinity College, Cambridge, with such emblematical accompaniments as seemed best calculated to indicate the magnificent objects of the researches and discoveries of that great philosopher, whose peculiar connexion with the Royal Society forms the most glorious circumstance in its annals.'

His Royal Highness then goes on to state, that his Majesty King William the Fourth, was pleased to accept 'the charge devolved upon him by the late king, and ordered, in consequence, that a fresh die should be cut, and that his effigy should form the obverse of the medal. This work also is completed. All the dies have been executed by Mr. Wyon with such boldness of outline, depth, and delicacy of finish, as do him the highest credit.'

'I am well aware that a diversity of opinion exists respecting the advantages which are likely to be conferred upon science by a frequent distribution of medals. It is said that they must either confirm or contradict the judgment which has either been already pronounced, or which posterity will most certainly hereafter pronounce, upon the merits, pretensions, and influence of the discoveries or series of investigations which such medals are designed to commemorate: that in the first case they can confer no additional honour upon their

author whose rank has already been ascertained and fixed by the sentence of a higher tribunal, while, in the second, they can only tend to compromise the character of the scientific body by whose advice they are conferred. It is true that I would not claim infallibility for the united judgment of any association, or of any body of men, however eminent their scientific rank may be: but it is the peculiar privilege of the great masters of science, (and more particularly so when acting or speaking as a body,) to be able to anticipate, though not without the possibility of error, the decision of posterity, and thus to offer to the ardent cultivator of science that brightest reward of his labours, as an immediate and well-assured possession, which he might otherwise be allowed silently and doubtingly to hope for, but never be permitted to see realized: and though some powerful minds might be content to intrust the complete development of their fame to the fulness of time, and might pursue their silent labours under the influence of no other motives but such as are furnished by their love of truth, the gratification derived from the discovery of the beautiful relations of abstract science, or from the contemplation of the agency of a Divine Mind, in the harmonies and constitution of the physical world, yet it is our duty and business to deal with men as we find them constituted, and to stimulate their exertions by presenting to their view honourable distinctions attainable by honourable means; to assure them that the result of their labours will neither pass unnoticed nor unrewarded; and that there exists a tribunal to which they may appeal, or before which they can appear, whose decision is always for honour, and never for condemnation.

‘ It is for these reasons, gentlemen, that I feel myself justified in expressing my opinion, that the power possessed by our council of conferring honorary rewards is a most salutary power, provided it be exercised boldly, impartially, and diligently; and that it may greatly promote the taste for scientific pursuits in this country, by presenting a more immediate prospect than would

otherwise exist, of a public and distinguished recognition of any valuable discovery, or of the completion of any important and laborious course of investigation.'

At the anniversary meeting, 1834, a letter was read from his Royal Highness the president, in which, after expressing his extreme regret that the state of his eyesight prevented his attendance, he says: 'Should the gentlemen kindly vote me again into the chair, aware as they are of my present infirmities, I can only accept the proffered offer upon an understanding, that should I not be better at this period next year, I may now be considered as giving them notice that I shall consider myself bound in duty to resign an office, the duty of which I am no longer able to perform.'

After an absence of two years from the society his Royal Highness again appeared at the anniversary meeting in 1836, and again in 1837. At the meeting for 1838, a letter from his Royal Highness was read, announcing his resignation. It was stated in this letter that circumstances would probably for a time interfere with the residence of his Royal Highness in London during a considerable part of the annual session of the society, and prevent his Royal Highness from receiving its members in a manner compatible with the rank and position of his Royal Highness in this country.

At this meeting the Marquis of Northampton was elected president, and that distinguished nobleman still continues to occupy the chair of the Royal Society.

Within the last few years a number of improvements have been made in the Royal Society, many of which, referring more particularly to the management of its affairs, need not be mentioned here; but some of them are of too great importance to be passed over without a slight notice.

About the year 1831, the council, with twenty-one of the fellows, formed themselves into a committee for

the purpose of revising the statutes, and also for inquiring whether it might be advisable to propose any alterations in the existing charter.

In the report of the council to the anniversary meeting on St. Andrew's day, 1831, it was stated that the powers granted by the existing charter appeared to afford ample means for the introduction of much improvement; that many of the statutes which in the course of time had become no longer conformable to the practice, or adapted to the existing circumstances, of the society had been rescinded; many which required an alteration in their form were remodelled; the language in which the whole was expressed was rendered more uniform, consistent, and precise; and several new regulations were introduced which seemed calculated to promote the objects and the welfare of the society.

Specific regulations were also adopted for facilitating the borrowing of books out of the library, and for ensuring their regular return at the proper period. Regulations were also formed respecting the loan of instruments belonging to the society, with a view to the accommodation of fellows wishing to borrow them.

The society having entered into an agreement with the trustees of the British Museum respecting the exchange of the Arundel Manuscripts¹ for books suited to the objects of the society, a sum of money was paid by the said trustees to the society, with the condition annexed, that the money was to be expended exclusively in the purchase of books, and that a list of the books so purchased should be sent to the trustees. The trustees expected to realize the greater part of the remaining sum due to the Royal Society on account of the Arundel Manuscripts, by the sale of duplicate books.

In consequence of this arrangement, the library of the society was enriched by a very large addition of

¹ These were included in the library presented by Mr. Henry Howard to the Royal Society in 1681. The value of these manuscripts was estimated at £3559. 3s.

works on scientific subjects which had long been wanting, for the supply of its deficiencies in those branches of knowledge the promotion of which is more particularly the object of the Royal Society.

In the report of the council, made in November 1832, it was stated that scientific books had been purchased at an expense of about £1600., and that the whole of the sum at which the Arundel Manuscripts were valued had been received from the trustees of the British Museum.

The increase of the library, and the probability of its future extension, having rendered it extremely necessary that a more enlarged space should be obtained than that afforded by the apartments then occupied by the society, application was made for the rooms lately occupied as the Privy Seal office, and they were with prompt liberality given up to the uses of the society.

The titles of the books presented to the society are usually inserted at the end of the volumes of their *Transactions*, and till about the year 1836 they possessed no further catalogue. A catalogue was then prepared under the superintendence of a committee of the society, by Mr. Panizzi, the keeper of the printed books at the British Museum. It is now published, and forms a thick octavo volume. 'Such a compilation it was considered would be of great value, not merely to the fellows of the society, but to men of science generally, by making known to them the treasures of a library, singularly rich and complete in journals and works on mathematics, physical, astronomical, and anatomical science, and by presenting them in such a form, that persons engaged in works of research, or in any specific subject of scientific inquiry, might be made at once acquainted with nearly all the sources from whence they could derive information.'

About the same time a catalogue of the manuscripts belonging to the society was made by Mr. Shuckard, and also a list of the philosophical instruments.

The council also directed the printing of an edition of the abstracts made by the secretaries, and entered on the journal-book of the society, of such papers as have been read to the society, and ordered for publication in their *Transactions*, from the year 1800 inclusive. 'They conceive that a collection of these abstracts, which possess in themselves much intrinsic value, will form an useful sequel to the abridgement of the *Philosophical Transactions*, of which the public is already in possession, but which does not extend to a later period than the end of the last century.'

CHAPTER V.

THE SCIENTIFIC SOCIETIES OF LONDON.

The British Museum—Subdivision of scientific Labour—The Linnean Society—The Royal Institution—The Royal College of Surgeons—The Museum at the India House—The Horticultural Society—The London Institution—The Geological Society—The Astronomical Society—The Zoological Society—The Geographical Society—The British Association—The Entomological Society—The Botanical Society—The Royal Botanic Society—The Ornithological Society—The Microscopical Society—Other Societies—Provincial Societies—Royal Society of Edinburgh—Royal Dublin Society—Royal Irish Academy—Societies at Manchester, Liverpool, &c.—The Cambridge Philosophical Society—The Ashmolean Museum at Oxford.

It was nearly a century after the institution of the Royal Society before a national museum of natural history was founded in our metropolis. The British Museum was opened in the year 1759, and the magnificent collection of Sir Hans Sloane, and the one formed by the Royal Society, were at that time deposited there.

But more than a century elapsed before any subdivision of scientific labour was attempted in our metropolis. The Royal Society had continued, from its first formation in 1663, to embrace within its aim the cultivation of every department of science ; but that science had prospered so well, and had grown to such an extent, that the labours of one society were inadequate to its future welfare. A number of separate and independent societies were gradually formed, each having in view the promotion of one particular department of science or of art. ‘The objects of science,’ said Dr. Priestley, ‘are so multiplied that it is high time to subdivide them. Thus the numerous branches of an overgrown family, in the patriarchal ages, found it necessary to separate ;

and the convenience of the whole, and the strength and increase of each branch, were promoted by the separation.'

This subdivision of scientific labour by the formation of separate societies was commenced with the concurrence and co-operation of the Royal Society itself. The promotion of zoology and botany was the chief object of the LINNEAN SOCIETY, which was established in the year 1778 by the late Sir James Smith, and received a royal charter in the year 1802. This society now occupies the house in Soho-square in which Sir Joseph Banks resided. Its museum consists chiefly of a collection of Australian marsupials, birds and reptiles, made principally by Messrs. Caley, Brown, and Gould; the entomological collection of Linnæus, with the additions made by Sir J. L. Smith; the entomological collection of Sir Joseph Banks, named on the authority of Fabricius. The cabinet of shells comprises the collections of Linnæus, Smith, Banks, and Pulteney. In the botanical department the museum is very rich, containing the herbaria of Linnæus, Smith, Pulteney, Relhan, Woodward, Winch, &c., besides a most valuable herbarium presented to the society by the honourable East India Company in the year 1833. The library is particularly rich in botanical works: it is open every day, except Saturday; and the museum on Wednesdays and Fridays from 10 to 4. This society has published nineteen volumes of *Transactions*, containing a variety of most valuable memoirs.

The ROYAL INSTITUTION was founded in the year 1799. This establishment has contributed to the progress of science by the lectures delivered there on various subjects, particularly of chemistry; by its excellent laboratory and by its library.

The ROYAL COLLEGE OF SURGEONS, situated on the south side of Lincoln's Inn Fields, was founded in the year 1800, and in the same year the museum of comparative anatomy of the celebrated John Hunter was purchased by government, and presented to the institution, upon condition that twenty-four lectures

should be delivered annually to members of the profession of surgery, and that the museum should be open to the public under certain regulations. Coleridge thus beautifully refers to this museum, and to the master-mind that formed it:—

‘We have said that improgressive arrangement is not method: and in proof of this we appeal to the notorious fact that zoology, soon after the commencement of the latter half of the last century, was falling abroad, weighed down and crushed as it were by the inordinate number and multiplicity of facts and phenomema apparently separate, without evincing the least promise of systematizing itself by any inward combination of its parts. John Hunter, who had appeared, at times, almost a stranger to the grand conception, which yet never ceased to work in him, as his genius and governing spirit, rose at length in the horizon of physiology and comparative anatomy. In his printed works, the finest elements of system seem evermore to flit before him, twice or thrice only to have been seized, and after a momentary detention, to have been again suffered to escape. At length in the astonishing preparations for his museum, he constructed it, for the scientific apprehension, out of the unspoken alphabet of nature. Yet notwithstanding the imperfection in the annunciation of the idea, how exhilarating have been the results! It may, we believe, be affirmed, with safety, that whatever is grandest in the views of Cuvier, is either a reflection of this light, or a continuation of its rays, well and wisely directed through fit media to its appropriate object.’

This museum, which is unparalleled in this country, has received some valuable additions, among which may be noticed the fossil bones, especially those of the *Megatherium* and *Milodon*, the carapax of the *Glyptodon*, and the head of the *Toxodon*. The museum is open to members, and persons presenting a member's order, on Mondays, Wednesdays, and Fridays, from 12 till 4. The library, which is rich in anatomical works, is open only to members of the college except by special permission.

In the year 1801 a library was commenced by the court of directors at the INDIA HOUSE, in Leadenhall-street. It contains a large collection of oriental manuscripts, maps, and books on general literature and science. A museum has since been added, in which are assembled both oriental antiquities and objects of natural history. The museum is open to the public every Saturday from 12 to 3: on other days admission is gained by a director's order.

The HORTICULTURAL SOCIETY was established in the year 1804, and obtained its charter in 1809. Although designed rather to promote luxury than science, this society deserves notice, since memoirs are given in its *Transactions* illustrative of vegetable physiology; and a portion of its ample funds is employed in procuring foreign plants, of which a rich assemblage exists in the extensive garden at Chiswick. The immediate superintendence of this garden is vested in a committee nominated at the first council after the anniversary. It is open from 9 o'clock till 6 every day except Sunday for the inspection of the fellows and visitors introduced by fellows, either personally or by order. From this garden seeds and cuttings are supplied gratuitously to the fellows. Three exhibitions are held annually at the garden, at which medals are awarded to the best exhibitors: on these occasions fellows alone are admitted without tickets, and are entitled to purchase tickets for the admission of their friends. The society has formed a collection of drawings of the most approved fruits and ornamental plants, kept for the inspection of the fellows in the library at the society's apartments, No. 21, Regent-street, and also an extensive collection of waxen models of fruit kept at the garden.

The LONDON INSTITUTION 'for the advancement of literature and the diffusion of useful knowledge,' was founded in the year 1805, and chartered in 1807. The sum originally raised for its support was 80,000*l.*, and further subscriptions were afterwards added. The sum of 35,000*l.* was expended on the building. The library, once under the direction of Porson, contains upwards of thirty thousand volumes including a very rich collection

of tracts and pamphlets. The laboratory and collection of philosophical instruments are excellent ; and lectures are delivered annually on various branches of natural philosophy and literature.

The GEOLOGICAL SOCIETY OF LONDON was established in 1807¹, and obtained its charter in 1826. This society has been eminently successful in giving a new impulse to the study of geology in this country. Its *Transactions* contain a vast body of new and interesting matter ; many memoirs, illustrated by maps and plates, furnish information respecting the mineral structure of the most distant parts of the globe ; but of the strata of England in particular they furnish details more ample than have as yet appeared respecting any tract of the same extent in the world. The library, collection of maps, and museum, are open to members daily. The apartments of the society are in Somerset House. At the meetings of this society oral discussion is permitted.

The institution of the ROYAL ASTRONOMICAL SOCIETY OF LONDON in the year 1821 was actively promoted by many of the distinguished fellows of the Royal Society. Its *Transactions* contain valuable contributions to astronomical science, among which may be mentioned the sets of tables for reducing the observed to the true places of stars. An incident which occurred during some of the proceedings of this society has given rise to one of the most extraordinary of modern inventions. To ensure accuracy in the calculation of certain tables, separate computers had been employed ; and two members of the society having been chosen to compare the results, detected so many errors as to induce one of them to express his regret that the work could not be executed by a machine. To this the other member, Mr. Babbage, at once replied that this was possible ; and from that time persevered in the inquiry which had thus suggested itself, until at length he produced a working model of a machine for calculating tables with surprising accuracy.

¹ The MINERALOGICAL SOCIETY OF LONDON, established in 1799, was incorporated with the Geological Society in 1811.

The ZOOLOGICAL SOCIETY was chartered in the year 1829. The museum of this society contains an extensive and valuable collection ; but it is not at present open to public inspection ; the intention being to include the whole in the new building now in the course of erection in the society's gardens in the Regent's Park. These gardens now form the leading feature of the society ; they contain an extensive and highly valuable collection of living animals. The gardens are open to fellows at all times, and to strangers, by order of fellows, on payment of one shilling each person ; but the order is not insisted on. The published *Transactions* of this society have greatly assisted zoological science.

The ROYAL GEOGRAPHICAL SOCIETY was established in 1830, and has apartments No. 3, Waterloo-place. The *Journal* of this society, of which a volume is published annually, contains much important and original information. The naval officers employed by government and the East India Company in surveying different coasts have made valuable contributions to this *Journal*, and many persons who have been sent out by government in a public capacity have added to the stock of useful information ; many travellers, also, who would have refused to publish their remarks in the shape of a book, have communicated them to the *Journal of the Royal Geographical Society*. Although the annual contribution of each member is but small, yet, by a judicious management of their funds, and the aid of government, the society has been enabled to send out travellers to many parts of the globe which are, as yet, imperfectly known. The society's apartments contain a good library.

In the year 1831 was established the BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. This association, which originated in a suggestion of Sir David Brewster, is formed on the model of that scientific congress of learned men upon the continent, whose proceedings have become so celebrated. In a very short time the association became a large, influential, and energetic body. 'It is composed not only of men whose names are already known, but a very large number of

juniors, particularly from the universities; and these have been joined by many influential individuals attached to intellectual pursuits, who, by their countenance and support, uphold the cause of science in the eyes of the public. The terms of admission, therefore, are easy; and the pecuniary contribution very small. The proceedings of the association differ materially from all those we have yet noticed. The meetings are annual, but, instead of being held at one place, the members assemble every year at some one of the great towns or cities of the empire. York, Oxford, Cambridge, Edinburgh, Dublin, Liverpool, Newcastle, Birmingham, Glasgow, Plymouth, Manchester, and Cork, have already witnessed this intellectual jubilee; for such it may be truly called, since it brings together men of known reputation and of congenial pursuits, separated by distance from personal intercourse. It may readily be supposed that such meetings unite all the advantages of those held by the *stationary* societies, with many others *they* cannot possess; and that a spirit of excitement and of tempered conviviality enlivens the whole; giving to this assembling together of the votaries of science the charm and the relaxation of a holiday-week. Yet there is still work to be done; the members are arranged into parties or *sections*, according to their respective pursuits; and reports are drawn up by each, of the progress made in any particular branch of knowledge during the past year. The greatest hospitality is generally shown by such members as are resident to those who come from a distance; speeches are made, toasts are drunk; and we can only regret the fate of those, who, from professional or other pursuits, have not the power of making so long an absence from home, and of sharing the intellectual and social pleasures of such instructive and pleasurable meetings¹.

¹ The above notice of the British Association is from Mr. Swainson's Discourse on the Study of Natural History, in the *Cabinet Cyclopædia*. For some of the other notices of scientific societies we are indebted to the Naturalist's Almanac for 1843.

The ENTOMOLOGICAL SOCIETY, which was established in 1833, has apartments at No. 17, Old Bond-street. It consists of twelve honorary, and an unlimited number of corresponding and ordinary members. A collection and library are in progress of formation. The *Transactions* of the society have hitherto been published in parts at irregular intervals; but it is now arranged that two shall appear in the course of the year.

The BOTANICAL SOCIETY OF LONDON was instituted in the year 1836, for the promotion and diffusion of botanical science; the formation of British and general herbaria; the exchange of specimens with other societies, or with individuals; the establishment of a library for reference and circulation; the holding of evening meetings for the reception of papers or other communications; and the publication of such important facts and views as may be laid before the society. This society has apartments at No. 20, Bedford-street, Covent-garden. Ladies are eligible as members.

A somewhat kindred society is the ROYAL BOTANIC SOCIETY in the Regent's Park, incorporated by charter in the year 1839. Its objects are defined by its charter to be the furtherance of the science of botany in all branches; in its application to medicine; to the arts and manufactures; and with the especial object of forming extensive botanical and ornamental gardens within the immediate vicinity of the metropolis.

The ORNITHOLOGICAL SOCIETY was established in the year 1837, for the purpose of breeding and forming collections of water-fowl,—first to supply the royal parks, and secondly, to distribute duplicates, gratuitously, among such members of the society as may be desirous of acquiring a collection of aquatic birds. The society endeavours to maintain a complete collection of water-fowl,—swimmers, divers, and waders. The birds are kept, as nearly as possible, in a natural state in St. James's Park, where the lake forms, as it were, a great natural cage.

The MICROSCOPICAL SOCIETY, established in the year 1839, has apartments at 21, Regent-street. Its objects are the promotion and diffusion of improvements

in the optical and mechanical construction, and in the mode of application, of the microscope; the exhibition of new and interesting microscopical objects and preparations, and the establishment of a library of standard micrographical works.

In addition to these societies, there are many others established for the promotion and improvement of agriculture, medicine, statistics, engineering, and the arts. Lest the omission of a separate notice of each of these be thought invidious, it may be stated that our chief object in this enumeration has been to convey some idea of the example and influence of the Royal Society in the establishment of scientific societies. It has been well said that ‘The labours already accomplished by these associations are such, that the Royal Society may be justly proud of them as the works of her children; and the high place which she continues to hold, in the promotion of the sciences generally, cannot fail to inspire the societies themselves with reverence for the body from whence they diverged.’

It does not fall within the plan of this volume to describe the various societies which have been formed in different parts of Great Britain, for the promotion of science; but it may, perhaps, be desirable to mention a few.

THE ROYAL SOCIETY OF EDINBURGH originated in a philosophical society formed in that city so early as the year 1739. In the year 1783 it was incorporated by royal charter. In 1811, the society obtained a new charter, by which it was empowered to form a library and a museum. A volume of *Transactions* is published occasionally. In the year 1819, Mr. Alexander Keith bequeathed to the society the sum of one thousand pounds, for the purpose of advancing the sciences and arts of Scotland. A medal of the value of sixty pounds, arising from part of the interest, is awarded as a biennial prize for the most important scientific discoveries which may be communicated to the society, and published in its *Transactions*. The medal was adjudged, for the first time in 1828, to Sir David (then Dr.) Brewster.

The ROYAL DUBLIN SOCIETY was incorporated by George II. in the year 1749. It occupies the late residence of the Duke of Leinster, in Kildare-street. The income of the society arises from the subscriptions of its members, and an annual parliamentary grant of 5300*l*. The museum is open to the public twice a week, and public lectures on science are delivered gratis.

The ROYAL IRISH ACADEMY, for promoting science, literature, and antiquities, was incorporated in 1786. Its funds are assisted by an annual parliamentary grant of 300*l*. It has a house in Grafton-street, and a good library, said to be peculiarly rich in ancient Irish MSS.

The Literary and Philosophical Society of Manchester, instituted in 1781, was the first example in one of our provinces of a large association of private individuals formed for the purpose of contributing funds for the publication of literary and scientific memoirs. Dr. Percival was the active promoter of this society, which has numbered among its members most of the distinguished natives of the vicinity, among whom the names of Dalton and Henry stand pre-eminent.

The Royal Institution of Liverpool was formed in the year 1814 by Mr. Roscoe, by shares or subscriptions of 100*l*. each, and opened in 1817. In 1822 the subscribers were incorporated by royal charter.

The Royal Geological Society of Cornwall was instituted in 1814; while at various times Philosophical Societies have been formed at Bath, Bristol, Hull, Leeds, Newcastle-upon-Tyne, Falmouth, and York. The Philosophical Society of Cambridge is distinguished for its valuable *Transactions*, while to Oxford belongs the glory of possessing the first cabinet of natural curiosities formed in England, namely, that of Sir John Tradescant, in the reign of Charles I. This cabinet, which contained many rare and valuable objects, was further enriched by his successor; and having become afterwards the property of Mr. Elias Ashmole, was by him bequeathed to the University of Oxford.

APPENDIX.

THE following is a list of the successive Presidents of the Royal Society, with the time of their election, and the number of years during which each held the office.

Presidents' Names.	Date of Election.	Years in Office.
William, Lord Viscount Brouncker.....	April 22, 1663 ...	14
Sir Joseph Williamson, Knight	Nov. 30, 1677 ...	3
Sir Christopher Wren, Knight.....	Nov. 30, 1680 ...	2
Sir John Hoskins, Bart.....	Nov. 30, 1682 ...	1
Sir Cyril Wyche, Bart.	Nov. 30, 1683 ...	1
Samuel Pepys, Esq.	Dec. 1, 1684 ...	2
John, Earl of Carbery	Nov. 30, 1686 ...	3
Thomas, Earl of Pembroke and Mont- gomery.....	Nov. 30, 1689 ...	1
Sir Robert Southwell, Knight		
Charles Montague, Esq. (afterwards Earl of Halifax).....	Nov. 30, 1695 ...	3
John, Lord Somers		
Sir Isaac Newton, Knight	Nov. 30, 1698 ...	5
Sir Isaac Newton, Knight	Nov. 30, 1703 ...	24
Sir Hans Sloane, Bart.	Nov. 30, 1727 ...	14
Martin Folkes, Esq.	Nov. 30, 1744 ...	11
George, Earl of Macclesfield	Nov. 30, 1752 ...	12
James, Earl of Morton	Nov. 30, 1764 ...	4
James Burrow, Esq.	Sept. 1764	
James West, Esq.	Nov. 30, 1768 ...	4
James Burrow, Esq.	July 1772	
Sir John Pringle, Bart.	Nov. 30, 1772 ...	6
Sir Joseph Banks, Bart.....	Nov. 30, 1778 ...	41
Sir Humphry Davy, Bart.	Nov. 30, 1820 ...	7
Davies Gilbert, Esq.....	Nov. 5, 1827 ...	3
H.R.H. the Duke of Sussex	Nov. 30, 1830 ...	8
The Marquis of Northampton, who still continues.....	Nov. 30, 1838	

ABSTRACT OF THE STATUTES OF THE
ROYAL SOCIETY, 1840.

ACCORDING to the present statutes of the society, every candidate for admission must be proposed and recommended by a certificate in writing, signed by six or more fellows, of whom three, at least, are to certify that their recommendation is from personal knowledge; and this certificate, containing the name, qualifications, &c. of the candidate, is to be delivered to one of the secretaries, and then to remain in the meeting-room of the society during five ordinary meetings, before he shall be put to the vote. The votes are taken by ballot; and of the number of fellows voting, at least two-thirds must vote in favour of the candidate, otherwise he is not elected. The person elected must appear for his admission on or before the fourth ordinary meeting of the society after his election, unless further time be granted by the council; otherwise the election is void. Before such appearance he must pay the sum of ten pounds for admission-money, unless such sum be remitted by special order of the council; he must also pay four pounds annually as long as he continues to be a fellow of the society; but the annual payments may be compounded for by paying at once the sum of forty pounds, by persons who were fellows of the society before the 11th December, 1834, or who have contributed a paper to the *Philosophical Transactions*, and sixty pounds by persons who may have become fellows subsequent to that date. Every fellow is entitled to receive, gratis, one copy of the *Philosophical Transactions*, on applying for the same in person, or by writing, commencing with the volume published next after his admission. A fellow is liable to ejection from the society if he shall 'contemptuously or contumaciously disobey the statutes or orders of the society or council, or shall by speaking, writing, or printing, publicly defame the society; or advisedly, maliciously, or dishonestly, do any thing to the damage, detriment, or dishonour thereof.'

A prince of the blood Royal, a peer of the United Kingdom, a member of the privy council, any foreign sovereign prince, or the son of a sovereign prince, may be proposed at one of the ordinary meetings of the society, and voted for on the same day; notice having been given of such proposal at the preceding meeting of the society. Foreign members, the number of whom is limited to fifty, are exempted from

certain obligations which ordinary fellows are enjoined to perform. They are to be selected from among men of the greatest eminence for their scientific discoveries and attainments.

The council and officers for the ensuing year are elected on the 30th November. The officers comprise the president, the treasurer, the principal secretaries, and the foreign secretary. The new council consists of eleven members of the existing council, and of ten fellows who do not belong to such council. These are nominated by ballot previously to the anniversary meeting.

The president presides at the meetings, and regulates the debates of the society, the council, and the committees; he states questions, calls for reports and accounts, checks irregularities, and observes that the statutes of the society are attended to. The president while in the chair remains covered while speaking to or hearing particular fellows, notwithstanding their being uncovered. The treasurer, or some person appointed by him, receives all monies due to the society, disburses all sums payable by it, and keeps the accounts of the society; he also has the custody of the title-deeds of the society's estates, the policies of insurance, &c. The secretaries have inspection over the assistant secretary; they give directions concerning the entry of minutes in the journal-books, &c.; they attend all meetings of the society, council, and committees of papers; on such occasions, when the president has taken the chair the senior secretary reads the minutes and orders of the preceding meeting, and afterwards takes minutes of the business and orders of the present meeting; these are to be entered by the assistant secretary in the books to which they relate. The members of the council form a standing committee for the publication of such papers as have been read or communicated to the society at their weekly meetings, and referred to their consideration. Not less than seven such members to form a *Quorum* capable of acting in relation to the said papers. The committee may call in the assistance of any of the fellows of the society 'who are knowing and well-skilled' in the particular branch of science to which the paper under deliberation relates, such persons being privileged to give their votes as if they were members of the committee. The secretaries have the charge, under the direction of the committee of papers, of printing the *Philosophical Transactions*. The assistant secretary, who is paid for his services, is not a fellow of the society. He enters all minutes in the journal-books, and makes an index to each; he has the custody

of the charter-book, statute-book, &c. and of all papers and writings belonging to the society. He attends at the library every day¹, from eleven to four, for the accommodation of such fellows, or of any other persons who have a written permission from the president, or any other member of the council, or who shall be introduced by a fellow in person, as come to read the books and MSS.

The anniversary meeting is held on St. Andrew's day; but if that day fall on a Sunday, the meeting is held on a Monday. At this meeting the officers are elected as already stated; and the death or recess of any fellow announced from the chair.

The session of the society commences on the third Thursday in November, and terminates on the third Thursday in June. The ordinary meetings are held once a week during the session, except during two weeks at Christmas, Passion, Easter and Whitsun-weeks, and the week during which the anniversary meeting is held. Thursday evening at half-past eight o'clock is the time for the ordinary meetings. Strangers are permitted to attend them on producing an order signed by a fellow. The business of the ordinary meetings is to read and hear letters, reports, and other papers concerning philosophical matters.

Special meetings may be called by the president or the council, or by any six fellows, delivering a notice to one of the secretaries.

The original copy of every paper read at the society, becomes the property of the society, unless there be a previous engagement with its author to the contrary: but any author may have a copy of his own papers by leave of the council. The papers read before the society in the course of each year are delivered to the committee of papers, and preserved for future inspection, and never lent out of the society's house without order of the council.

¹ The library is closed on Sundays, on Good-Friday, and during Easter, Whitsun and Christmas-weeks; and also during a period in each year, appointed by the council.

The office of librarian is now merged into that of the under secretary, who is allowed the assistance of a clerk in keeping the books, and performing the general business of the society. The qualifications for the under secretary, as stated at pp. 39, 40, are now very considerably modified.

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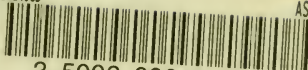
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